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STRAITS BRANCH

OF THE

ROYAL ASIATIC SOCIETY.

JUNE, 1891.

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THE GRASSES AND SEDGES OF THE MALAY PENINSULA.

BY

H. N. RIDLEY, M.A., F.L.S.

IN publishing this list of the Grasses and Sedges of the Peninsula (*Gramineæ* and *Cyperaceæ*), I am well aware that it is by no means complete. From many parts of the Peninsula we have no specimens of these families, and especially is this the case as regards the great mountain region which traverses the Peninsula. From the uplands we shall doubtless procure many interesting kinds when the country is more opened up, and from the northern parts of the Peninsula bordering on Siam we may expect to obtain many Assam and Burmese species not yet met with. This list rather represents the lowland glumaceous flora of the South.

A country which like this is covered with dense forest for the greater part is, as a rule, poorly provided with grasses and sedges, for few of these plants occur in high forest. Yet on the whole there is a considerable variety, and among them not a few very interesting and curious plants are to be met with.

I am much indebted to Professor HACKEL of St. Polten for identifying many of the grasses, and to Mr. C. B. CLARKE for much assistance in the matter of *Cyperaceæ*.

Habitats.—The most productive localities for grasses and sedges are the damp low swamps and rice-fields, the banks of streams and the sandy shores of rivers and seas. The open country where the jungle has been cleared and secondary forest is returning is very barren of plants of interest, although large tracts are covered with glumaceous plants. *Imperata, Ischœmum, Paspalum, Panicum* of the *Digitaria* section form the bulk of the grass flora here, while the *Cyperaceæ* are represented by a few common *Sclerias*, *Rhynchospora Wallichii* and *Fimbristylis*. The low swampy ground and rice-fields are rich in the genera *Panicum, Isachne, Leersia, Scirpus, Rhynchospora, Scleria, Heleocharis* and *Cyperus*. Along the streams and rivers some fine species may be met with, among which *Scleria oryzoides*, *Scirpus grossus* and *Sc. mucronatus*, *Lepironia*, many *Cyperi*, the common reed *Phragmites Roxburghii,* and the wild sugar-cane *Saccharum arundinaceum* and *S. Ridleyi* are very conspicuous; the last three grasses forming huge thickets in many places. The *Sclerias,* too—*Scl. malaccensis* and *Scl. oryzoides*—often cover large tracts of wet open land, forming jungles about six feet high, very laborious to traverse. In the dense forests the glumaceous plants almost disappear, yet there are several very interesting genera to be met with. The large group of *Hypolytreæ* is well represented here by many species of *Mapania* and *Pandanophyllum*. The latter of which, as the name denotes, so much resemble the smaller species of screw-pines that, unless the inflorescence is found, they may be easily mistaken for them. Grasses are almost unrepresented in the deep jungle. *Centotheca lappacea* and *Lophatherum*, however, sometimes find their way far in, being transported widely by their very adherent spikelets attaching themselves to wild beasts. In many places, too, there are large tracts of bamboos, but at present specimens of these in flower have rarely been met with, so that of what species they are is not yet known.

On the sandy districts by the sea and along the river banks, a large number of species are to be met with, and among them several very striking plants. Such are the Porcupine grass (*Spinifex*), *Thouarea*, a curious creeping grass, *Schœnus calostachyus*, Poir, two species of *Eriachne, Gahnia, Lepturus, Tricostularia* and many other species worthy of cultivation.

Some of our native grasses are worthy of cultivation as ornamental plants, among these the *Saccharums* and *Phragmites* form large tufts like those of Pampas grass. The *Pandanophylla* and *Mapaniæ* are fine foliage plants suited for pot culture, and *Pogonatherum* and *Fimbristylis monophylla* with their fine leaves and stems also make elegant pot plants for mingling with those of larger foliage.

The larger *Andropogons*—*A. citratus*, *A. nardus* and *A. muricatus*—are cultivated for their sweet scent; the first producing the well known lemon grass oil, the second citronella. Of other grasses of economic value, it is only necessary to mention rice (*Oryza sativa*), sugar-cane (*Saccharum officinarum*), millet (*Sorgum vulgare* and *S. saccharatum*), and the numerous species of bamboos cultivated here.

The plumed seeds of *Imperata arundinacea* are used by the Malays to stuff pillows; of the stem of *Scirpus grossus* and *Lepironia mucronata* they make mats, and walking sticks are made from *Thysanolæna* in Sungei Ujong. A kind of beer was at one time made from the rhizomes of Lalang, which contain a good deal of sugar. The manufacture was not remunerative and was soon given up.

The grasses and sedges which form the greater part of the turf here are *Andropogon acicularis*, *Cynodon dactylon, Ischœmum ciliare*, besides which, in some places *Fimbristylis monophylla*, *F. tenera* and *F. communis* form a considerable portion. I have seen a lawn almost entirely composed of *Zoysia pungens*, a soft inland form. It makes a very deep soft turf, but is unsuitable for tennis lawns, except in dry places, where it becomes short and compact. For sandy places *Andropogon aciculare* and *Cynodon dactylon* are best. Where the soil is better the *Ischœmums* form a better class of turf. The best native fodder grass here is unquestionably *Ischœmum muticum; I. ciliare* and *I. timorense* are also very good. *Panicum jumentorum,* the Guinea grass, has been introduced as a fodder plant, but must be used with caution, as horses have been killed by overfeeding with it.

Distribution.—A large number of the glumaceous plants of the Peninsula are very widely distributed throughout the Indo-Malayan region. A few are cosmopolitan, occurring in all parts of the world that are warm enough for them; such are *Cyperus polystachyus*, *C. rotundus*, *C. distans*, and *Fimbristylis communis* among *Cyperaceæ; Cynodon dactylon*, *Digitaria sanguinale, Eleusine indica* among grasses. A small number of sea-shore plants have an Australian facies; such are *Schœnus calostachyus*, *Fimbristylis sericea*, *Spinifex squarrosus*, *Lepturus repens*. With them occur also such Australian forms as *Casuarina equisetifolia*, *Leucopogon*, *Dianella*, *Melaleuca* and *Philydrum* in the lowlands near the sea; and on the mountains of the interior we also meet with *Boeckia*, *Leptospermum*, *Cryptostylis*, *Corysanthes* and *Dacrydium*. All these are to be found also in the Malayan Archipelago, and a few, *e.g.*, *Dianella*, *Cryptostylis*, *Spinifex* and the *Lepturus* as far West as Ceylon. This seems to indicate a wave of Australian immigrants westwards, some of which, such as *Casuarina* and the grasses, at least were brought by sea-currents along the island shores.

There are two grasses which are certainly of American origin, viz., *Chloris barbata* and *Paspalum conjugatum*. The latter is very common in the cultivated districts, but seems to disappear in the interior. In Penang, are two Indian grasses which do not appear in the South of the Peninsula, viz., *Thysanolæna acarifera*, Nees, which is typically Burmese, and *Eragrostis Wightiana*, a rare grass only known in the mouth of the Hooghly and in one place in Ceylon.

Native names.—Such native names as I have been able to find I have inserted. The derivations or translations are only suggested. It is often very difficult to get at the idea of a Malay when he names a plant, so many of the names are absurd and apparently meaningless.

The common name for grass is "Rumput," but this means also almost any small plant, such as Rumput Kra-Nas, Ape's rice grass, *Vandellia crustacea*. "Senderaian" is a general name for *Cyperi* and *Sclerias*.

CYPERUS.

C. pumilus, Linn. Sandy places. Not common.
Singapore—Changi, Selitar.
Malacca—Ayer Panas. Also collected by GRIFFITH.
Penang—Dato Kramat.
Native name, Rumput Taman (Malacca).

C. polystachyus, Rottb. Very common in waste ground, sea shores, etc.
Singapore—Very common everywhere.

Penang—Waterfall, Government Hill, Telok Bahang, etc.
Sungei Ujong—Seremban.
Pahang—Pekan, Sungei Meang.
Kelantan—Kamposa.

Native name, Rumput Parah Betina.

Var. *laxiflora.* Usually in damper spots.
Singapore—Changi, Tanglin.
Penang—Telok Bahang.
Selangor—Bukit Kudah.

Var. *ferruginea.*
Singapore—KURZ.

C. alopecuroides, Rottb. Damp spots by streams. Rare.
Penang—Bagan Jermal.
Kelantan—Kamposa.

C. castaneus, Willd.
Perak—Dr. KING's Collector.

These are the only specimens I have seen from the Peninsula.

C. cuspidatus, H. B. K.
Penang—Dato Kramat. This is the form *angustifolia.*

C. compressus, L. Common in waste ground.
Singapore—Changi, Tanglin, etc.
Penang—Sepoy Lines.
Malacca—Ayer Panas.
Sungei Ujong—Port Dickson.

Native name, Rumput Tiga Sari (Malacca), "three angled grass."

C. Zollingeri, Steud. Common in kampongs, orchards, etc.
Singapore—Tanglin, Changi, Fresh Water Isle.
Penang—Waterfall Hill, Government Hill, Telok Bahang.
Pahang—Pekan.
Malacca—Pulau Besar.

C. platystylis, R. Br. Was collected in Penang by WALLICH, and distributed with the number 3359*D.* I have not met with it.

C. Griffithii, Steud. Common on sandy shores on both coasts. This is a very variable plant, the most striking form of which is one with swollen thickened spikelets, which was described as *C. radians* by NEES, but which is certainly not specifically distinct. It is much less common than the typical *C. Griffithii* with flat spikelets, but occurs mixed with it, at Pekan. There is also a dwarf form with very short stem, having the lower spikelets almost buried in the sand, and I met also with a curious flaccid form with long grassy leaves, and the glumes almost, or indeed in some specimens quite, foliace-

ous. This was growing in a very damp spot where a stream entered the sand, at Sungei Meang in Pahang.
Singapore—Changi. Plentiful.
Malacca—Pulau Besar.
Penang—Telok Bahang, Batu Feringgi.
Pahang—Rumpin River, Cherating, Sungei Meang, Pekan, Kwala Pahang. Very common along the coast.
Kelantan—Kamposa.

C. haspan, L. Common in swampy spots.
Singapore—Tanglin, Tivoli, etc.
Penang—Tanjong Bunga.
Selangor—Kwala Lumpur.
Malacca—Chabau, Ayer Panas.
Pahang—Kwala Pahang.
Native names, Rumput Sumbo (? "wick grass"), R. Bilis Jantan (Bilis is a kind of fish, "male fish grass," probably because it grows by streams).

C. flavidus, Retz. With the preceding, but less common.
Singapore—Tanglin.
Penang—Tanjong Bunga.

C. elegans, L. (*C. diffusus*, Vahl). Woods. Fairly common.
Singapore—Bukit Timah.
Selangor—Pataling Caves, Kwala Lumpur.
Penang—Pulau Betong. Also collected here by WALLICH (No. 3474).
Pahang—Katapong near Pekan.

C. turgidulus, C. B. Clarke. Common, especially near the sea in sandy kampongs and open woods.
Singapore—Changi.
Penang—Tanjong Bunga, Waterfall.
Sungei Ujong—Gunong Brembun.
Pahang—Rumpin River, Praman, Pekan.
Siam—Bangtaphan (Dr. KEITH).
Native name, Rumput Chukor Kerbau, "buffalo razor-grass."

C. iria, L. A common weed in gardens and plantations.
Singapore—Tanglin, Jurong, Chan Chu Kang, Changi.
Penang—Bagan Jermal, Waterfall, Dato Kramat.
Kelantan—Kamposa.
Malacca—Ayer Panas.
Native name, Rumput Suloh Bulahlang (Malacca). Literally, "dragon-flies torch."
Var. *micriria*. This is a very small form, only an inch or so tall,

with narrow leaves, which not rarely occurs in damp spots rather speedily dried. I met with it at Toas in Singapore.

C. pulcherrimus, Willd. Damp spots.
Penang—Pulau Betong.
Selangor—Kwala Lumpur.
Pahang—Katapong.
Siam—Bangtaphan (Dr. KEITH).

C. distans, Linn. fil. A common roadside and waste ground weed here, as it is almost all over the tropics.
Singapore—Ang Mo Kio, Tanglin, and many other places.
Penang—Sepoy Lines, Dato Kramat.
Selangor—Caves, Kwala Lumpur.
Kelantan—Kamposa.
Siam—Bangtaphan (Dr. KEITH).
Malacca—Pulau Undan.

Native name, Rumput Vanggi (Malacca). Perhaps "Wangi" "scented grass."

C. malaccensis, Lam. Muddy streams near the sea, and on the beach. Not very common.
Penang—Waterfall.
Pahang—Pekan.
Tringganu—Pulau Ketam.
Kelantan—Kamposa.

C. pilosus, Vahl. One of the commonest species, and somewhat variable in height, colouring and compactness of umbel.
Singapore—Changi, Ang Mo Kio, Tanglin, Jurong, Chan Chu Kang.
Johor—Tanah Merah Road.
Malacca—Common.
Penang—Waterfall, Tanjong Bunga.
Selangor—Kwala Lumpur near the Club, Bukit Kuda.
Sungei Ujong—Port Dickson, Kwala Sawar.
Pahang—Pekan, Katapong.

C. procerus, Rottb. Not common.
Penang—Waterfall.
Kelantan—Kamposa.
Malacca—Chabau, Ching.

Native name, Rumput Munsiang.

C. rotundus, L. A common weed.
Singapore—Tanglin, Chan Chu Kang, &c.
Penang—Bagan Jermal, Sepoy Lines.
Pahang—Pekan.

Malacca—Common in the town and elsewhere.
Siam—Bangtaphan.

C. stoloniferus, Retz. Muddy shores, and grassy spots near the sea. Common.
Singapore—Changi, Tanjong Ru; also Pulau Buru and Raffles Lighthouse Island.
Penang—Bagan Jermal.
Pahang—Kwala Pahang.
Kedah—Langkawi Islands.
Malacca—Shores near the town.

C. auricomus, Sieber. Damp spots near stream. Local.
Penang—Dato Kramat.
Selangor—Bukit Kudah, Kwala Lumpur.
Pahang—Katapong near Pekan.
Sungei Ujong—Kwala Sawar.

C. elatus, L. Was collected in Penang by WALLICH (No. 3341*a*). I have not seen any other specimens.

C. (§ *Diclidium*) *ferax*, A Rich. Damp spots. Rare.
Selangor—Kwala Lumpur.
Pahang—Katapong.

MARISCUS.

M. dilutus, C. B. Clarke. Damp spots. Not rare.
Singapore—Bukit Timah, Selitar.
Selangor—Kwala Lumpur.
Perak—Gopeng (Calcutta Herbarium, C. B. CLARKE).
Pahang—Pekan.
Kelantan—Kamposa.

M. pennatus, Lam. Sea shores common, more rarely inland.
Singapore—Selitar, Bajau, Tanjong Ru.
Johor—Tana Runto.
Malacca—Ayer Panas, Alor Gajah.
Kelantan—Kamposa.
Pahang—Sungei Meang.
Native names, Rumput Bumbot, "twisted grass," R. Surai, R. Sulengsen.

M. biglumis, Gaertn. Local.
Var. *cylindrostachys*.
Penang—Pulau Betong.
Sungei Ujong—Pantai.
Pahang—Pulau Tioman.
Singapore—Common.

Var. *cyperina.*
Penang.
Pekan—Katapong.

M. dubius, Rottb. Very common on sandy shores by the sea.
Singapore—Cathedral compound, Changi.
Penang—Tanjong Bunga.
Province Wellesley—(Dr. King).
Malacca—Pulau Besar.
Pahang—Pekan, Rumpin River, Sungei Meang.
Kelantan—Kamposa.
Siam—Bangtaphan (Dr. Keith).

M. umbellatus, Vahl. Very common in waste grounds, woods, etc.
Var. *typica.*
Sungei Ujong—Gunong Bumbur.
Pahang—Katapong.
Var. *cylindrostachys.* The commonest form.
Singapore—Ang Mo Kio, Selitar, Tanglin.
Johor—Tanah Runto, Pengerang.
Malacca—Alor Gajah.
Selangor—Kwala Lumpur.
Penang—Government Hill.
Pahang—Rumpin River.
Siam—Bangtaphan (Dr. Keith).
Var. *picta.* A very compact headed form with almost sessile squarrose spikes.
Sungei Ujong—Gunong Bumbur.
Siam—Bangtaphan (Dr. Keith).

The native names are Rumput Tangot Baong "bearded umbrella grass," and Rumput Pinang "palm grass."

KYLLINGA.

K. monocephala, Rottb.
Singapore—Botanic Gardens, etc.
Malacca—Ayer Panas.
Pahang—Pekan.

Native Names, Rumput Tuki, Rumput Butang, "button grass," a name also applied to *Eriocaulons* and *Rhynchospora Wallichii.*

K. brevifolia, Rottb. A common weed.
Singapore—Almost everywhere, Selitar, Bajau, etc.
Penang—Government Hill.
Johor—Scudai River.

Pahang—Kwala Pahang, Pekan.
Malacca—Common.

K. cylindrica, Nees. Local. Not at all common.
Singapore—Raffles Institute (HULLETT).
Siam—Bangtaphan (Dr. KEITH).

FIMBRISTYLIS.

F. nutans, Vahl. Damp marshy spots on sandy heaths. Local.
Singapore—Changi.
Malacca—Pulau Besar.
Penang—Telok Bahang, Tanjong Bunga.
Pahang—Rumpin River, Kwala Pahang.

F. schoenoides, Vahl.
Penang—Telok Bahang, Tanjong Bunga.

F. argentea, Vahl. Sandy banks of rivers. Rare.
Kelantan—Kamposa.

F. æstivalis, Vahl. Damp sandy spots.
Singapore—Tanglin.
Pahang—Katapong, Kwala Pahang.
Native name, Rumput Surai.

F. diphylla, Kth. Very common.
Singapore—Changi, Tanglin, Selitar, etc.
Malacca—Pulau Besar near the town.
Sungei Ujong—Seremban.
Penang—Waterfall.
Johor—Tanah Merah Besar.
Pahang—Pekan.
Native names, Rumput Parah (Parah is a measure), R. Pūrun Batu, "mat grass," which grows in stony places.

F. sericea, R. Br. Sandy shores. Rare. East coast only.
Pahang—Cherating, Kwala Pahang, Pekan, Sungei Meang.
Kelantan—Kamposa.

F. pauciflora. (*F. malaccana*, Boeck. *F. filiformis*, Kth). Very common.
Singapore—Abundant—Tanglin, Changi, Chan Chu Kang, Government Hill, Rochor, Pulau Tekong.
Johor—Tanah Merah Road.
Sungei Ujong.
Penang—Waterfall, etc.
Pahang—Pekan, Praman.
Native name, Rumput Girah.

F. tenera, Var. *obtusata*, C. B. Clarke. Not rare. In sandy open places. Mr. Clarke says "a very remarkable plant, which I have had several times before. It has the leaves of *F. disticha*, but the glumes are not distichous. It is perhaps a species."

Singapore—Botanic Gardens in the turf, Jurong sandy spots, Bukit Mandai roadside, Bukit Timah.
Penang—Telok Bahang.
Malacca—Sungei Baru Ulu.
Pahang—Kwala Pahang.

F. asperrima, Beckler. Forms large tufts in woods. Not very common.

Singapore—Bukit Mandai (base of the hill), Botanic Gardens a weed in the flower beds).
Penang—Government Hill, Tanjong Bunga, Waterfall, Telok Bahang.
Malacca—Tanjong Kling, Bukit Bruang.
Sungei Ujong—Gunong Burumban.

Native names, Rumput Siamet. Perhaps from "Siya," "useless." R. Bavang (Sungei Ujong). Perhaps "Bawang," "onion grass," from the resemblance of its leaves to those of an onion. R. Pulot (Sungei Ujong), "rice grass."

F. miliacea, Vahl. Common in muddy damp spots.

Singapore—Tanglin, Ang Mo Kio, Selitar, etc.
Penang—Waterfall, Tanjong Bunga.
Malacca—Ayer Panas, Ching, etc.
Johor—Tanah Runto.
Pahang—Pekan, Kwala Pahang.
Kelantan—Kamposa.

Native name, Rumput Tai Kerbau "buffalo dung grass" (Malacca). This is probably so called from its coming up where boffaloes have been feeding, these animals eating it, and passing the seed which eventually germinates.

F. globulosa, Kth. Damp spots. Local.

Malacca—Bukit Sabukor, Ayer Panas.
Penang—Waterfall.
Pahang—Pekan, Kwala Pahang.

Var. *foliata*, Bckler. Malacca (Jagor).

Native name, Rumput Sandang.

F. retusa, Thwaites. Stated by Boeckeler (Cyperaceæ, p. 582) to have been gathered by Griffith in Malacca. I have not met with.

F. glomerata, Nees. Sandy places usually near the sea.

Singapore—Tampenis Road near Bukit Mandai, Saranggong.
Johor—Tanah Merah Road.
Pahang—Cherating, Kwala Pahang.
Malacca—Tanjong Kling.

F. setacea, Benth. Wet spots. Local.
Singapore—Bank of the lake in the Gardens.
Pahang—Pekan.

F. longispica, Steud. Sandy spots, East coast. Rare.
Pahang—Kwala Pahang, Rumpin River, Pramau.

F. tetragona, Br. Sandy heaths.
Pahang—Kwala Pahang.

F. leptoclada Benth. Sandy places.
Singapore—Bukit Timah, Changi.
Pahang—Kwala Pahang.

SCIRPUS.

Sc. grossus, Linn. fil. Not rare in rice-fields. Used in making mats and baskets, under the name of Rumput Musiang and R. Murong (Penang).
Malacca and Penang—In the paddy-fields. Not rare.
Pahang—Near Pekan.
Kelantan—Kamposa.

Sc. mucronatus, L. Common in ponds and ditches.
Singapore—Swamp near Thompson Road, Reservoir, Ang Mo Kio, Tivoli.
Malacca—Ayer Panas.
Selangor—Kwala Lumpur, Klang.
Penang—Pulau Betong.
Pahang—Ayer Etam, Pekan.
Sungei Ujong—Kwala Sawar.

Sc. supinus, L. Local. In swamps and sawars.
Penang—Waterfall.
Malacca—Selanda.

It is called Rumput Prut Tikus in Malacca. This is literally "mouse intestine grass."

S. juncoides, Roxb. In similar localities to the preceding.
Malacca—Bukit Sabukor, Bukit Tunggal.
Penang—Waterfall.

BULBOSTYLIS.

B. barbatus, Rottb. Common on sandy paths, sea-shores, etc. A curious proliferous form occurred at Pekan, with long slen-

der branches one inch long springing from the unusually large capitulum of flowers.
Singapore—Changi, Tanglin, etc.
Penang—Batu Feringgi.
Perak.
Pahang—Kwala Pahang, Pekan, Katapong.
Tringganu—Pulau Ketam.
Malacca—Tanjong Kling, etc.

B. puberula, Poir. Sandy places. Rare.
Singapore—No locality (CANTLEY).
Karimon Isles.
Malacca—(GRIFFITH).

TRICOSTULARIA.

T. borneensis, Benth. Sandy heaths. Rare, but plentiful where found.
Pahang—Pekan, Praman.

FUIRENA.

F. glomerata, Lam. Common in swamps, rice-fields and ditches.
Singapore and Malacca—Common everywhere.
Penang—Waterfall, Sungei Ujong, Bukit Sulu.
Pahang—Pekan.

It is called Rumput Buku Buloh (Būku Būluh, *i.e.*, grass with nodes like a bamboo), R. Kululot (Malacca), Trigonia grass. (The Kululot is a small species of bee, genus *Trigonia*, which collects pollen from this plant. R. Lidah Munkerang (Sungei Ujong).

LIPOCARPHA.

L. argentea, R. Br. Common in damp spots, by streams in open country.
Singapore—Very common, Tanglin, Chan Chu Kang, &c.
Malacca—Common.
Sungei Ujong.
Johor—Tanah Merah Road.

It is called Rumput Rotan, "rattan grass," in Sungei Ujong.

L. microcephala, Steud. Rare. A new record for the Peninsula.
Singapore—Chan Chu Kang in dry turf, Bukit Mandai ditch by roadside.

LEPIRONIA.

L. mucronata, Rich. Local in muddy spots near mangrove swamps.
Singapore—Jurong, Tampenis Road near Changi.
Malacca—(Griffith).

ELEOCHARIS.

E. chætaria, R. & S. Common in shallow ditches and damp spots. An elongate floating form occurs not rarely in deeper water.
Singapore—Tanglin, Chan Chu Kang, etc.
Selangor—Kwala Lumpur.
Pahang—Pekan, Kwala Pahang.
Malacca—Tanjong Kling, Ayer Molek.
E. capitata, R. Br. Rare.
Singapore—Changi, Tampenis. Plentiful in ditches by the roadside.
E. variegata, Var. *laxiflora*. Common in ditches, ponds, etc.
Singapore—Tanglin, Reservoir.
Penang—Telok Bahang, Waterfall.
Pahang—Kwala Pahang.
Malacca—Near Ayer Molek.
E. ochrostachys, Steud. Fairly common. Very closely resembling the preceding one.
Singapore—Near the Garden lake.
Malacca—Merlimau.
Pahang—Katapong near Pekan.
E. equisetina, Presl. Rare.
Penang—Stone quarry near the Waterfall.

MAPANIA.

M. longa. Benth. Rare. A large tufted plant growing in streams, resembling a *Sparganium* in habit.
Singapore—Chan Chu Kang.
M. humilis, Naves and Villar. An elegant plant for pot cultivation, the leaves being somewhat like those of a *Pandanus*, and purple. Common in jungle.
Singapore—Kranji, Bukit Timah, Bajau, Chan Chu Kang.
Perak—Maxwell's Hill.
Malacca—Selandar.

Called Poko Seak Seak Rimbah. Perhaps this should be "Poko Siya Siya Rimbah," *i.e.*, useless jungle plant. It is used for fever.

M. bancana, Benth and Hook. A common woodland plant growing in damp spots in the jungles.
Singapore—Changi, Ang Mo Kio, Kranji, Toas, Selitar.
Malacca.
Penang—Waterfall Hill.
Sungei Ujong—Gunong Brumbun.
Selangor—Pataling.
Pahang—Pekan.

It is known as Rumput Supidang, R. Giring Giring, "rattle grass," R. Susat Balukar (Sungei Ujong).

M. palustris, Benth and Hook. Forms large tufts in thick jungle.
Singapore—Pulau Ubin, Chan Chu Kang.

It is called Poko Mengkuang Tudong and P. Menkuang Lubo, from its resemblance to the Mengkuang (*Pandanus furcatus*).

M. multispicata, C. B. Clarke.
Singapore—Bukit Timah.

SCIRPODENDRON.

Sc. costatum, Kurz.
Singapore—North Selitar and Changi. I believe this very curious plant is not at all uncommon, but it resembles so much a young *Pandanus* that it is easily overlooked. It is a native of Ceylon and Java, and this new locality forms a connecting link between these two regions.

HYPOLYTRUM.

H. proliferum, Boeck. Local. In wet jungle.
Singapore—Selitar, Chan Chu Kang.
New to British India.

H. latifolium, Rich. In wet jungle.
Singapore—Chan Chu Kang, Jurong.
Pahang—Ayer Etam.

REMIREA.

R. maritima, L. Common on most of the sandy shores.
Singapore—Changi near the Police Station.
Malacca—Tanjong Kling.
Penang—Batu Feringgi.
Pahang—Cherating, Sungei Meang, Kwala Pahang.
Kedah—Langkawi Islands.
Siam—Bangtaphan (Dr. KEITH).

RHYNCHOSPORA.

R. aurea, Vahl. Very common in damp spots.
Singapore and Malacca—Everywhere.
Selangor—Batu Tiga, Kwala Lumpur.
Pahang—Pekan.
Sungei Ujong—Common, Kwala Sawar.

R. Wallichiana, Kunth. Not rare. In dry open country among bracken and lalang.
Singapore—Jurong, Selitar, Bajau, etc., Sungei Murai. Fresh Water Island.
Malacca—Pulau Besar, Bukit Tunggal. Also collected by GRIFFITH.
Pahang—Kwala Pahang.

It is called Rumput Butang ("button grass") in Singapore.

Forma *sylvestris.*
Leaves very slender and grassy; heads very small and compact, usually green and not red. Damp woods.
Karimon Isles.
Malacca—Mount Ophir (R. DERRY).
Penang—Government Hill.

R. glauca, Vahl. Var. *chinensis.* Damp sandy spots. Rare.
Singapore—Changi near Tanah Merah, abundant.

R. malasica, C. B. Clarke. Very local.
Singapore—Bukit Mandai, growing in streams. I have only found this curious plant in this one spot, but it is very plentiful here. Mr. CLARKE says he has also seen it from Malacca and Borneo.

CLADIUM.

Cl. Maingayii, C. B. Clarke.
Malacca—Mount Ophir (R. W. HULLETT).

Cl. glomeratum, Nees. Rare. In water.
Singapore—Bukit Mandai, Changi towards Tanah Merah.

"The first specimens I have seen from Malaya," says Mr. CLARKE. "It is a common Australian plant, also known from China and Japan."

SCHŒNUS.

Sch. calostachyus, Poir. Sandy places near the sea. Rare.
Singapore—Changi near Tanah Merah. Abundant.
Pahang—Praman near Pekan.

Mr. CLARKE says:—"An interesting though apparently wide-spread plant. I have it from various parts of Australia, Louisiade Archipelago, Waigiou and Borneo, but not before from British India."

GAHNIA.

G. tristis, Nees. Sea shores, more rarely from inland localities. Rather common, but not to be met with everywhere. Usually in rocky spots above the sea. There is a weaker form which occurs in woods in the interior, with very much slenderer leaves.
Singapore—Forts Siloso and Serapong, Upper Mandai, Tampenis Road near Changi. Pulau Battam.
Karimon Isles.
Selangor—Seppan.
Johor—Scudai River, Tanah Runto.
G. javanica, Zoll. Mountains at a considerable altitude.
Perak—Gunong Batu Puteh at 6,700 feet altitude (Wray).
G. sp.
Perak—Maxwell's Hill (Curtis).

SCLERIA.

This genus, which is rather a difficult one, is well represented here, but I am sure that a number more will be found when carefully sought.

Scl. caricina. Diplacrum caricinum, R. Br. Common in waste places, paths and damp spots.
Singapore—Tanglin, Tivoli, Changi. Common.
Malacca—Merlimau, Pulau Besar.
Pahang—Kwala Pahang, Pekan.
Scl. lithosperma, Nees. Common in dry country.
Malacca—Alor Gajah.
Penang—Waterfall Garden.
Pahang—Rumpin River, Kwala Pahang.
Sungei Ujong—Linggi River.
Scl. lateriflora, Bckler. Not common.
Singapore—Changi.
Penang—Telok Bahang.
Scl. steudeliana, Miq. Rare.
Penang—Waterfall.
Scl. hebecarpa, Nees. Common in open country.
Singapore—Jurong.
Penang—Tanjong Bunga.

Malacca—(Griffith).
Pahang—Pekan.
Siam—Bangtaphan (Dr. Keith).

Scl. oryzoides, Presl. River banks. Local, but plentiful where it occurs.
Singapore—Changi towards Tanah Merah.
Malacca—Banks of Merlimau River, and also near Malacca, Ching.

Native name, Rumput Leeku Dana. Possibly an error for "Lichu Daun," polishing leaves, *i.e.*, used for polishing wood.

Scl. malaccensis, Bckler. Very common, often covering large tracts of wet ground.
Singapore—Everywhere, Tanglin, Jurong, Bukit Timah.
Malacca—Common.
Selangor—Kwala Lumpur.
Pahang—Pekan.

Scl. multifoliata, Bckler. In thickets, scrambling through bushes.
Malacca—Pulau Besar.
Pahang—Pekan.

Scl. lœvis, Willd.
Johor—Tanah Merah Road.
Pahang—Kwala Pahang.

Scl. sumatrensis, Retz. Common in dry open places.
Singapore—Tanglin, Bukit Timah, Jurong.
Penang—Government Hill, Tanjong Bunga.
Malacca—Alor Gajah, and other places.
Johor—Tanah Merah Road.
Sungei Ujong—Gunong Brumbun.
Selangor—Bukit Kuda, Klang.
Perak.
Pahang—Kwala Pahang.
Siam—Bangtaphan (Dr. Keith).

It is called Rumput Kumbar in Sungei Ujong. "Kumba" is an ornament made of coco-nut leaves, which is perhaps the origin of the name.

Scl. chinensis, Kth. New to this country.
Pahang—Kwala Brawas, Pekan.

Scl. androgyna, Nees. Collected by Griffith in Malacca. I have not met with.

CAREX.

C. cryptostachys, Brngn. Wet rocky places.

Singapore—Bukit Timah.
Penang—Government Hill.
Perak—Taiping.
Sungei Ujong.
Native name, Rumput Ringgin (Sungei Ujong).

C. sp.
Penang Hill, rocky places on the summit.

GRAMINEÆ.

PASPALUM.

P. scrobiculatum, Linn. Common everywhere, and apparently native.
Singapore—All over the island.
Johor—Tanah Merah.
Malacca—Ayer Panas.
Selangor—Kwala Lumpur.
Penang—Waterfall Garden.
Sungei Ujong.
Pahang—Pekan, Kwala Pahang, etc.
Natives names, Rumput Tulo Sintadok, "caterpillar grass," R. Liku, "smooth grass" (Malacca), R. Ijok, "green grass" (Sungei Ujong).

P. distichum, Burm. In sandy mud near the seashore. Common.
Singapore—Tanjong Karong, Bajau, Sungei Murai.
Johor—Tanah Merah Road, Tanjong Bunga.
Penang—Bagan Jermal.
Pahang—Sungei Meang.

P. conjugatum, Berg. Native of South America, but now widely distributed. It chiefly occurs along paths and in waste places near villages, being transported by its very adherent fruits, but in the wilder parts of the country does not occur. It forms a good fodder grass.
Singapore—Common everywhere.
Johor—Shores of the strait near Johor.
Malacca—Common.
Penang—Waterfall Garden.
Pahang—Pekan.
Siam—Bangtaphan (Dr. KEITH).
Sungei Ujong—Common.

ISACHNE.

I. australis, R. Br. Common in damp swampy spots.

Singapore—Tanglin, Changi.
Johor—Summit of Mount Ophir (HULLETT), Pengerang.
Pahang—Pekan, Katapong.
Penang—Waterfall Garden.
Malacca—Ayer Panas, common.

I. pulchella, Roth. Common in rice fields and wet spots.
Singapore.—Chan Chu Kang, Ang Mo Kio, Kranji.
Malacca—Bukit Tunggal.
Penang.

Ophismenus burmanni, Retz. Not common.
Penang—Sepoy Lines.

O. compositus, Wight. Shady woods. Widely distributed, but not very common.
Malacca—Bukit Tunggal.
Pahang—Kwala Pahang.
Pulau Buru, near Karimon Islands.

PANICUM.

P. (Digitaria) sanguinale, Trin. Common in waste ground.
Singapore—Botanic Gardens, Changi.
Penang—Waterfall.
Pahang—Rumpin River, Sungei Meang.
Var. *australe*. Occurs in Singapore, and Penang near the Waterfall.

P. parvulum, Nees Common weed.
Singapore—Botanic Gardens, Changi, Jurong, Raffles Lighthouse.
Penang—Waterfall.
Pahang—Sungei Meang.

P. volascens, Nees. Rare.
Singapore—Bajau. A form with glabrous spikelets.

P. heteranthum, Nees. Rare. Sandy shores, beneath the casuarinas.
Pahang—Rumpin River, Sungei Meang.

P. cimicinum, Retz. Weed near villages and old cultivations.
Singapore—Tanglin, Tivoli, Changi, Chan Chu Kang.
Penang—Waterfall, Tanjong Bunga.

P. (Brachiaria) nodosum, Kth. *P. multinode* Presl. Common in thickets and woods.
Singapore—Tanglin, Dalvey Road, etc., Chan Chu Kang. Freshwater Isle.
Penang—Waterfall, Government Hill, Pulau Betong.

Pahang—Pekan.
Kelantan—Kamposa.
Native name, Sarong Buaya (Penang). Perhaps this should be "Sarang," *i.e.*, crocodile's nest.

P. subquadriparum, Trin. Rare.
Singapore—Changi.

P. luzonense, Presl. Not very rare. Chiefly in new cleared ground and roadsides.
Penang—Waterfall.
Malacca—Alor Gajah.
Pahang—Katapong.
Perak.

P. trigonum. Shady woods. Common.
Malacca—Pulau Besar, Sungei Udang.
Penang—Sepoy Lines.
Pahang—Pekan, Kwala Pahang.
Sungei Ujong—Bukit Sulu.
Native name, Rumput Mutubong, R. Kurubong Padi (Sungei Ujong). Perhaps grass which surrounds the rice, *i.e.*, weed in the rice fields.

P. radicans, Retz. Shady woods. Common.
Singapore—Bukit Timah, Changi, Tanglin.
Penang—Government Hill.
Pahang—Pekan.
Selangor—Klang.
Malacca—Alor Gajah, Ayer Molek, etc.
Perak.
Sungei Ujong—Port Dickson.
Native name, Rumput Telor Ikan ("fish-egg grass"), from the resemblance of the small black spikelets to fish eggs.

P. ovalifolium, Poir. Rare. Shady woods.
Pahang—Kwala Pahang.
Penang—Government Hill.
Malacca—Bukit Bruang.

P. ischæmoides, Retz. Sandy spots. Local.
Singapore—Changi.
Pahang—Pekan.
Kelantan—Kamposa.
Penang—Waterfall.
Malacca—Ching.

P. concinnum, Nees. A very handsome grass not rare in woods.
Singapore—Sumbawang, Tanglin.

Malacca—Selandor, Bukit Sadanau.
Penang—Moniot's Road.
Perak.
Selangor—Klang.

Called Rumput Jangot Ali and Akar Tongkat Ali. *i.e.*, "Ali's beard grass," "Ali's walking-stick root." The roots are eaten by Malays in Malacca along with betel-nuts. It is also called Rumput Poko Kulubong.

P. incomptum, Trin.
Perak—Gunong Hijau (Wray).

P. jumentorum. Is cultivated here and there for fodder.

P. (*Hymenachne*) *auritum*, Presl. Pools and ditches. Not rare.
Singapore—In the Reservoir, Changi, Ang Mo Kio.
Penang—Waterfall, Tanjong Bunga.
Pahang—Pekan, Mahang.
Siam—Bangtaphan (Dr. Keith).
Malacca—Stream near Alor Gajah.

P. myurus, Meyer. Ditches. Not very common.
Malacca—Ayer Panas, Ching.
Penang—Near the coast.
Sungei Ujong—Burunang, Kwala Sawa, where it is called Rumput Kumpai, and used for making lamp-wicks.

P. myosuroides, R. Br. Common in ditches.
Singapore—Ang Mo Kio, Kranji.
Malacca—Chabau.
Pahang—Pekan.
Penang—Pulau Betong.

Native name, Rumput Kumani.

P. indicum, L. Very common. Dry waste places.
Singapore—Bukit Timah, Changi, etc.
Johor—Tanah Merah.
Pahang—Praman.
Penang—Waterfall.
Malacca—Selandar, etc.

Native names, Rumput Bidis, R. Bonto Darat.

P. Ridleyi, Hackel. Dry thickets.
Malacca—Pulau Besar, Bukit Bruang.
Pahang—Pekan.

Near *P. foliosum* and *zizanioides*; with the latter General Monro classed it. It was also collected by Griffith in Malacca.

P. plicatum. Rare.
Selangorv—Caes, Kwala Lumpur.

Sungei Ujong—Pantai.

P. (*Echinochloa*) *crus-galli*, L. Not common.
Singapore.
Penang—Waterfall, Bagan Jermal.
Kelantan—Kamposa.
Selangor—Bukit Kudah.

P. *colonum*, L. Common in waste grounds.
Singapore—Tanglin, Changi.
Penang—Near the coast.
Malacca—Near the town.

SETARIA.

S. *glauca*, Beauv. Open country. Not very common.
Singapore—Ang Mo Kio, Tanglin.
Penang—Abundant in paddy-fields.
Malacca—Chenana Puteh.
Pahang—Pekan.

Native name, Rumput Julong-Julong. Perhaps "julung-julung," waving grass.

S. *dasyura.* Waste places, open country.
Singapore—Chan Chu Kang.
Pahang—Pekan.

PENNISETUM.

P. *italicum*, L. Millet, a plant rarely cultivated here, has turned up now and again as a waif of cultivation, Malacca.

THUAREA.

Th. *sarmentosum*, Thouars. In sand on the sea shore. Rare.
Singapore—Changi near the Police Station.
Pahang—Common under the casuarinas on the shore at Rumpin River, Cherating and Sungei Meang.

SPINIFEX.

S. *squarrosus*, Labill. Porcupine grass. Sandy shores of the East Coast. Plentiful in places.
Siam—Bangtaphan (Dr. KEITH).
Pahang—Rumpin River, Cherating, Sungei Meang, Kwala Pahang.

It is very curious to see the detached bristling heads of this grass whirled along the sands by the wind.

LEPTASPIS.

L. *urceolata.* Damp woods. Local, but very widely distributed.

The spikelets are very adhesive, and by adhering to animals get carried about the jungle.

Singapore—Pulau Ubin, Chan Chu Kang.
Johor—Summit of Mount Ophir (Hullett).
Malacca—Selandar, Ayer Panas, Bukit Sadanen, etc.
Selangor—Kwala Lumpur, Bukit Kudah, Bukit Etam (Kelsall).
Perak—Tapa (Wray).
Sungei Ujong—Gaong Jalan.

It is called Tampa Kulang or Kulang; Tampo Glang and Getah Puyuh (Malacca), "pigeon birdlime," because the spikelets adhere to pigeons.

COIX.

C. lachryma-Jobi, L. Job's tears. Is apparently not native. It occurs commonly near villages, as in Singapore at Selitar; near Johor town; Penang, Bukit Tumujang; Sungei Ujong, etc.

The native name is Mulai Tikus.

ZEA.

Z. mays, L. Maize is cultivated, but to a small extent, and chiefly used as a vegetable. It is more extensively grown in Kelantan.

ORYZA.

O. sativa, L. Commonly cultivated, and often occurring as an escape.

Native name, Padi Pulot.

O. sativa, Var.? A very curious plant, with broad green leaves and thin flower spikes, the spikelets falling off very readily. Grows in damp thickets and muddy spots by the stream at Ayer Etam in Pekan, and also nearer to the town, in the open country at the back. It is perhaps a form of the common rice, gone wild, or possibly a distinct species. It is very distinct and dissimilar to the common form.

LEERSIA.

L. hexandra, Sw. Swampy ground, ditches, etc. Common.
Singapore—Tanglin, Changi, etc.
Penang—Waterfall.
Pahang—Pekan.

Malacca—Rice-fields.

THYSANOLŒNA.

Th. acarifera, Nees. Woods. Rare.
Penang Hill.
Sungei Ujong.

It is called Buluh Tubarau, and used for making walking canes in Sungei Ujong. It is an elegant bamboo-like grass, forming thick tufts about six feet tall.

PEROTIS.

P. latifolia, Br. Sandy places usually near the sea. Not rare.
Singapore—Changi, Cathedral compound.
Karimon Islands.
Penang—Tanjong Bunga, Telok Bahang.
Pahang—Kwala Pahang, Pekan. Common.
Siam—Bangtaphan (Dr. KEITH).

ZOYSIA.

Z. pungens, L. Sandy ground. Common, especially near the sea. On the sea-shore it becomes very stiff and wiry. In damper ground it forms a very deep soft turf, but is not suited for lawns, except in sandy spots, where it makes a short compact turf.
Singapore—Common. Changi, Tanglin, Tanjong Ru, etc.
Malacca—Common, in and around the town.
Pahang—Pekan.
Tringganu—Sea shore.

IMPERATA.

I. exaltata, Retz. Rather a handsome lalang, larger and with a more branching spike than the common one. Rare, in thickets.
Singapore—Chan Chu Kang, Toas, Bajau.
Selangor—Pataling near Kwala Lumpur, and Langat.
Sungei Ujong—Along the rail banks between Port Dickson and Kwala Sawar.

It is called Lalang Jawa, *i.e.*, Javanese lalang.

I. cylindrica, Cyr. Far too common in the Peninsula wherever cultivation has spread, and often covering large tracts of country. Its growth after burning of the forests is remarkably rapid, as it propagates itself by its feathery seeds, as well as by its rhizome. A large tract covered with the plant in fruit looks from a distance as if it were covered with snow. It seems to prefer hot and dry places, but dislikes wet or very sandy soil. In the first, its place is taken by *Scleria malaccensis* and other such plants, in the latter by *Bracken* (*Pteris aquilina*, L.) or *Gleichenia*. It is a grass of very little use, as cattle and horses do not care for it on account of its hardness. Pigs, however, are very fond of the young shoots. Attempts have been made to use it for paper making, but without much success, and a kind of beer is sometimes made from the rhizomes. The plumed seeds are sometimes used to stuff pillows. It is very common in Singapore, Johor, Penang, Malacca, Province Wellesley and Selangor, but seems to be rarer in the less cultivated districts, and notably in Tringganu, Pahang and Kelantan.

SACCHARUM.

S. arundinaceum, Retz. River banks. Local. A very ornamental grass. In good wet localities it grows to a height of 12 feet or more, with very large panicles of flowers.

Selangor—Kwala Lumpur near the Caves.

Pahang—Ayer Etam near Pekan, forming large thickets.

S. officinarum, L. Sugar-cane is cultivated chiefly in Province Wellesley and Perak.

S. Ridleyi, Hackel. Banks of the river at Pekan and for some way up above, forming large tufts and covering a large tract of flat country on the right bank. It has narrow leaves and tall spikes of purple flowers. Professor HACKEL remarks that it is a very interesting plant belonging to the section *Miscanthus*, of which only one species (*S. fuscum*, Griff.), an Indian plant, was previously known.

Pollinia ciliata, Linn. Forming large clumps on the river bank. Rare.

Pahang—At Renchong above Pekan.

P. Ridleyi, Hackel. On sandy shores very close to the sea. Rare, but plentiful where it occurs.

Pahang—Rumpin River, Sungei Meang.

Allied to *P. Cumingiana*, Steud., a Philippines plant.

POGONATHERUM.

P. polystachya, R. Br. Often cultivated in Singapore as a pot plant. Not common.

Penang—Rocks by the Waterfall.

Pahang—Banks of the river at Renchong.
Siam—Klingtoi River, Bangtaphan (Dr. KEITH).

DIMERIA.

D. ornithopoda, Trin. Paths and dry open ground. Not rare in Singapore.

Paths in the Garden jungle, and in the grass plots, Tivoli, Selitar.
Var. *subramosa*, sub-var. *imperfecta*, Changi.

ROTTBOELLIA.

R. glandulosa, Trin. Not rare on the edges of woods, and in thickets.

Singapore.
Pulau Buru near Karimon Isles.
Selangor—Caves, Kwala Lumpur, Bukit Kudah.
Pahang—Pekan, Rumpin River.

R. geminata, Hackel. Open country in Pekan and Rumpin River. Rare.

This is a new and curious species, which has not as yet been found elsewhere. It was described from these specimens by Professor HACKEL.

R. sp. Changi.

ISCHŒMUM.

I. muticum, L. One of our commonest grasses, forming a good turf and a good fodder grass. Very variable in height and form. In long grass or fern, it becomes drawn up and tall, in open dry spots, more prostrate, shorter and stiffer, creeping widely.

Singapore, Johor, Penang, Malacca, Sungei Ujong. Very common.
Pahang—Pekan, Sungei Meang.
Perak—Changkat Jerim (WRAY).
Siam—Bangtaphan (Dr. KEITH).

The natives call it Rumput Trutoos, R. Tamaga, and consider its leaves a cure for headache.

I. ciliare, Retz. Common on roadsides in Singapore, and probably elsewhere in the Peninsula. I have gathered it at Kranji, Bukit Timah and Ang Mo Kio.

I. timorense, Kunth. Roadsides.

Singapore—Kranji, Tanglin.
Penang.

I. aristatum, L. Dry open country. Not common.

Singapore—Blakang Mati.
Sungei Ujong—Without locality.
Malacca—Near Ayer Molek.

Var. *submuticum*, Hack. A variety with the very small awn enclosed in the glumes. Fresh Water Island.

This plant is called Rumput Ekor Chari.

ANDROPOGON.

A. contortus, L. Sandy turf near the sea shore.
Singapore—Changi near the Police Station.
Malacca—Pulau Besar.
Penang—Waterfall Gardens, Batu Feringgi.
Pahang—Near the Sultan's tombs, Kwala Pahang.

A. aristulatus, Hochst. Sandy shores. Rare.
Siam—Bangtaphan (Dr. KEITH).
Pahang—Kwala Pahang, Pekan.

A. aciculatus, Retz. Very common and known in the Straits as "love grass." It forms a good turf, and in Pahang covers large tracts of country.
Singapore, Johor, Malacca.—Abundant.
Penang—Waterfall Gardens.
Pahang—Pekan, etc.

A. intermedius, R. Br. The Straits form is, Professor HACKEL says, a laxer form than the Australian type. Not common.
Malacca—Ayer Panas.
Pahang—Pekan.

The natives call it Rumput Pipit, "sparrow grass."

A. Schoenanthus, L. and ***A. nardus***, L. Often occur as escapes from cultivation, but are not wild here.

A. squarrosus, L. Possibly native, but often cultivated. I have seen it half wild at Bajau in Singapore, and Mr. CURTIS sends it from Tanjong Tokong in Penang.

SORGHUM.

S. vulgare, L., and the variety *saccharatum* are sometimes cultivated.

THEMEDA.

Th. arguens, Hack. Roadsides. Not common.
Malacca—Selandar.
Penang—Telok Bahang, Waterfall Gardens.

It is called in Malacca Rumput Sarang Pipit, "bird's nest grass," as the birds use its spikelets for building their nests.

Th. gigantea, var. *villosa*. Common. A very tall showy grass forming big tufts, and throwing up very tall panicles.
Singapore—Fort Siloso (said to have been introduced).
Johor—Tanah Merah Road near Johor Bharu.
Malacca—Pulau Besar.
Selangor—Kwala Lumpur, by the railway and near the Caves.
Penang—Bukit Mertajam.
Pahang—Pekan.
Sungei Ujong—Near Kwala Sawar.

APLUDA.

A. varia, Hack. Not common. Pastures and river banks.
Pahang—Katapong, Renchong.

SPOROBOLUS.

S. diander, Beauv. Dry spots.
Singapore—Raffles Lighthouse.
Malacca—Ayer Panas.
Johor—Tana Runto.

Native name, Rumput Tulo Bulalang, *i.e.*, the grass on which the dragon-fly balances itself.

S. elongatus, Beauv. Dry heaths.
Johor—Tanah Runto. Fresh Water Island.
Penang—Sepoy Lines.
Pahang—Pekan.
Karimon Islands.

ERIACHNE.

E. chinensis, Benth. Dry, open, sandy spots. Common where it occurs, but local.
Singapore—Fort Siloso.
Pahang—Pekan.

E. triseta, Nees. Dry, sandy heaths. Rare.
Pahang—Pekan and Kwala Pahang, abundant.
Malacca—Pangkalan Balau.

CYNODON.

C. dactylon, L. Rather common in sandy and dry spots.
Singapore—Common.
Penang—Sepoy Lines, Waterfall.
Malacca—In the town.

CHLORIS.

C. barbata, Probably introduced from the West Indies.
Johor—Near the Sawmills.
Province Wellesley—Batu Kawan.

ELEUSINE.

E. indica, L. Very common in waste grounds near villages.
Singapore—Tanglin, Changi.
Johor—Tanah Runto, Johor Bharu.
Penang—Waterfall Gardens.
Perak—Tapa (Wray).
Sungei Ujong—Port Dickson, with a form approaching the cultivated *E. coracana*.
E. ægyptiaca, L. Not very common. On the sea shore.
Singapore—Changi.
Pahang—Kwala Pahang, Sungei Meang.

LEPTOCHLOA.

L. sp.
Penang—Bagan Jemal.
L. chinensis, Nees.
Kelantan—Banks of River Kamposa.

ARUNDO.

A. donax, L. This, a native of Southern Europe, is often cultivated here, especially a form with varigated leaves.

PHRAGMITES.

P. Roxburghii, Kth. The common reed. Banks of streams and damp spots. Not rare.
Singapore—Fresh Water Isle.
Selangor—Kwala Lumpur, Pataling, all along the river.
Malacca—Merlimau, Selandar.
Penang—Western Ayer Etam.
Pahang—Pekan River bank.
Native name, Rumput Mata Burong Puding, "variegated bird's-eye grass."

CENTOTHECA.

C. lappacea, Beauv. Very common in woods and along paths. Carried about by its adhesive spikelets.
Singapore—Both the hispid and glabrous varieties common

over the whole island.
Johor—Tanjong Bunga, etc.
Penang—Government Hill, Tanjong Bunga.
Malacca—Ayer Panas, Pulau Besar, etc.
Pahang—Kwala Pahang.
Negri Sembilan—Bukit Tumiang.

Native names, Rumput Silit Kain. Perhaps the grass that damages the clothes, *i.e.*, by adhering to them. R. Darah, "blood grass."

LOPHTHERUM.

L. gracile, Brngn. Woods. Rather local.
Singapore—Chan Chu Kang.
Malacca—Chabau.
Sungei Ujong.
Perak—Birch's Hill, Larut (WRAY), Taiping (HERVEY).

Native names, Rumput Kururut, R. Jarang, "spreading grass," R. Klurat.

ERAGROSTIS.

E. pilosa, L. Weed in cultivated ground.
Singapore.
Penang.

E. plumosa, Retz. A garden weed. Very common.
Singapore—Abundant.
Penang, Dato Kramat, the Fort.
Malacca—Ayer Panas, etc.
Pahang—Pekan, Katapong.
Kelantan—Kamposa.

E. Brownii, Kth. Dry spots. Widely scattered.
Karimon Islands.
Penang—Government Hill, Waterfall.
Kelantan—Kamposa.
Pahang—Kwala Pahang.
Malacca—Common.

E. zeylanica, Br. Damp, sandy spots.
Singapore—(N. CANTLEY).
Pahang—Kwala Pahang.

E. ferruginea, Thunb. Sandy spots.
Singapore—Changi, Bukit Timah.
Pahang—Pramau, Pekan, Katapong, common.

E. unioloides, Nees. Very common in dry places.
Singapore—Tanglin, Changi, Jurong.

Johor—Scudai River, Johor Bharu.
Malacca—Tanjong Kling, Ayer Panas.
Penang—Waterfall.
Pahang—Pekan.
Kelantan—Kamposa.

E. Wightiana, Nees. Very rare.
Penang—Near the coast.

E. nutans, Retz. Dry, sandy heaths. Not common.
Pahang—Pekan.
Siam—Bangtaphan (Dr. KEITH).

LEPTURUS.

L. repens, R. Br. Sands of the sea shore. Rather rare.
Pahang—Sungei Meang, Rumpin River.

BAMBUSACEÆ.

There are a good number of species of bamboos to be met with in a wild state in the Peninsula, but very few of them have been collected. It is nearly impossible to identify a bamboo out of flower, and, as is well known, it is by no means common to find plants in flower. So that it is almost a rule among tropical botanists that whenever a bamboo is seen to be in flower specimens must be collected. There are large extents of bamboos in many parts of the Peninsula, but of what species is not yet known. I met with a large patch of a species of *Dendrocalamus* in Bukit Kuda near Klang, of which every joint was full of most excellent water, even the twigs being full though the ground beneath was remarkably dry. Several species of bamboo are cultivated, some for ordinary use, others as hedges, or for the edible shoots, especially *Bambusa nana*, the hedge bamboo.

GIGANTOCHLOA.

G. verticillata, Monr. Common and often cultivated. I found it in flower at Tivoli in Singapore.

G. heterostachya, Murr.
Malacca—Ayer Panas (GRIFFITH).
I have not seen this species.

MELOCANNA.

M. Blumei, Nees. Singapore—Roadside at Selitar. The flowering glumes, HACKEL says, are larger than the type. It is perhaps a variety. It is not a large species, about 12 or 14 feet tall, with rather broad dark green leaves.

M. gracilis, Kurz.

Singapore—(Wallich 5,032).

I have not seen this. It appears to be a small plant about 10 feet tall.

DENDROCALAMUS.

D. strictus, Nees. Munro, in the Monograph of Bamboos, mentions having received this from Singapore from Montgomerie, and says that it is a variety with very large whorls of the inflorescence. I do not think the species is anywhere wild in Singapore, but perhaps his specimens came from a garden. It is the well-known male bamboo so much in request for spear handles.

D. flagellifer, Munro. Common and probably native, but it is most frequently seen near villages, in Singapore at least.

Singapore—Jurong.
Malacca—Bukit Sabukor.
Siam—Bangtaphan, extremely common (Dr. Keith).

D. giganteus, Munro. *Bambusa gigantea*, Wallich. Wallich obtained his specimens from Penang, but whether it was wild there, or cultivated, does not appear. I have not seen or heard of it from there. It is stated to be indigenous to Malacca, and Mr. Derry told me he thinks he has found the plant in Bukit Sadanen, whence he sent cuttings to the Botanic Gardens. The magnificent plants in Peradeniya Gardens, Ceylon, are well known to every visitor there. It has been often introduced into Singapore, but does not grow at all to its normal size, and indeed appears not to thrive at much less than 1,000 feet altitude.

BAMBUSA.

B. nana, Thw.

The hedge bamboo most cultivated, supposed to be a native of China.

OUTLINE OF THE HISTORY OF THE DINDINGS FROM THE 17TH CENTURY TO THE PRESENT TIME.

BY

E. M. MEREWETHER.

IN the following brief account of the Dindings, I do not pretend to place before the readers of this Journal much that is new. I have merely endeavoured to put together in a connected form as much of the History of the Dindings as I have been able to gather from the sources at my disposal, in the hope that it may be of some interest to those who only know the Dindings by name. For the History of the Dutch Occupation of Pangkor, I am indebted to Mr. W. E. MAXWELL'S article on the Dutch in Perak, published in Vol. No. 10 of this Journal, and to his Note on the same subject in Vol. No. 11.

1661. The earliest mention of the Dindings is found in a letter from the Governor-General and Board of Administration of the United East India Company, dated 1st October, 1661, discovered among the Dutch records in Malacca, in which an order is given to cut 200 pieces of a certain red wood at Pulau Dinding (Pangkor) to be sent to "Patria" (Holland). From this it may be assumed that the Island became known to the Dutch before that date, probably when they established their factory in Perak in 1650, which was cut off in 1651.

1663. Two years later, on the 29th November, 1663, an old Dutch navigator named WOUTER SCHOUTEN visited Pulau Dinding on his way to Bengal, and wrote an account of his voyage, from which I take the following extracts:—

"On the 25th November in the evening sighted Malacka for the second time, and advanced four miles with the land wind; then anchored, waiting for daybreak; weather now lovely. Sunshine and a temperate sky with a following breeze with which we set sail and passed the green, rocky mountains of Cape Ressados (Rachado?), steering now South-West for some hours, and then North to fetch above the dangerous reef of Poelo Parselar. Coming under the green coast of the kingdom of Pera, we sighted the Poelo Sambilan or Nine Islands, which having passed, we headed for the island of Dingding, and arrived on the 29th November in the Roadstead between that Island and the mainland of Pera, close to the Watering-place..................

"Having reached the neighbourhood of the Watering-place on the inner side of the Island Dinding above-mentioned, we immediately sent a good party of sailors to the coast of Pera opposite to procure firewood for our further voyage to Bengal. The others went to Poelo Dinding to fetch fresh water from one of the principal Rivers of the island, and we, not to be idle, went also on shore with a line of 80 fathoms and brought up fish out of the Gulfs and Bays of the Island Dinding, going on board in the evening with a good haul of all sorts of well-flavoured, delicate fish.

"In the same way, on the next day, the 30th November, our people still being engaged in fetching water and firewood, we roamed all about and visted all parts of the Island Dinding, taking at last a good haul; we remained on shore all night with our Sub-Merchant ABRAHAM DE WIJS and others in the same way inclined and there we enjoyed our catch..........

"The Island Dinding, about 30 miles to the North-West of Malacka, is uninhabited, full of high Mountains, vast Forests and very deadful Wildernesses. The sea coast is here and there covered with terrible large Rocks and overhanging Cliffs, which are overgrown in a wonderful way with Verdure and Underwood, and some with very high Trees, so that one cannot very well walk round the Island along the beach............The sweet water flowed down from the high woody Mountains between great ravines, making its way down to the Sea in numerous little Rivers, and we found it lovely, agreeable and clear. It is said that in Amboyna and on this Island Dinding the best fresh water of the whole East Indies is found, and this I believe to be the fact, for I myself (in my own opinion) have never in any other country in India drunk better water than in these two places."

He goes on to relate how he and his friends "heard in the wildernesses many Rattle-snakes," but they did not see any although they "made search for these monsters." The Pangkor of to-day is very well provided in the matter of reptiles, but the rattlesnakes must have left the island when the Dutch did, for I have never heard of one being seen. What SCHOUTEN heard was probably the hamadryad (*Ophiophagus elaps*), which makes a peculiar noise, but not with its tail. He also mentions that they "plucked the Oysters of the Trees," and gravely proceeds to explain how they got there, as "this might seem to some people incredible."

After a stay of five days, WOUTER SCHOUTEN left Pangkor and proceeded on his voyage to Bengal on the 3rd December, but, meeting with bad weather immediately after leaving, he had to put back to refit, and left again finally the next day.

Turning again to the Malacca records, we find a letter dated 1670. 5th August, 1670, in which orders are given to take possession of Pulau Dinding, and to build there a stronghold of wood; and another letter dated 31st October in the same year laying down that the garrison shall consist of 1 sergeant, 3 soldiers and 3 sailors. There is nothing to show when this order was carried out, but DAMPIER, who visited Pangkor 19 years later, found there "a Governour and about 20 or 30 soldiers" and a fort of stone (brick?). 1689. Besides the fort, the Governor had a house about a hundred yards away, where he used to spend the day, but he never trusted himself outside the fort at night on account of the hostility of the Malays, who, as VALENTYN says of Perak Malays generally, were, "very foul and murderous." The Perak Malays seem to have had a bad reputation from the earliest times. HAMILTON, alluding to the "cutting off" of the Dutch factory in Perak in 1651, remarks that "the inhabitants are so treacherous, faithless and bloody that no European nation can keep factories there;" and, speaking of "Selangore" and "Parsalore," he observes that the inhabitants "have too many of the *Perak qualities* to be trusted with honest men's lives and money."

DAMPIER gives an interesting description of the fort and the Governor's house as he found them. The ruins of the former still exist, and, though they are in a very tumble-down condition, it is easy to see how accurate DAMPIER'S description was; but no trace remains of the house, which was built of timber.

He also gives a most amusing account of an entertainment given by the Governor to Captain MINCHIN and a Mr. and Mrs. RICHARDS who were on board his ship. They went ashore in the afternoon to call on the Governor, and Captain MINCHIN treated him to brandy-punch, in return for which the Governor sent out a boat to catch some fresh fish, as an addition to the other fare of the fort, and invited them to "supper." The boat came back about 5 o'clock, the fish was cooked at once, a fresh bowl of punch was brewed, and the Governor sat down with his guests and the officers from the fort prepared to do ample justice to this good cheer. But hardly had they fallen to, when one of the soldiers raised an alarm of "Malayans," which produced a most remarkable effect on the Dutch section of the party. The Governor, without saying a single word, leapt through a window and was off like a hare in the direction of the fort; the officers and servants followed suit with great promptitude; and the three guests were left behind in amazement "at this sudden Consternation of the Governour and his people." They followed, however, to the fort, where they found the Governor (possibly rather ashamed of his precipitate flight now that he was in safe quarters) waiting to receive them. The door was then shut, and the soldiers proceeded to fire the guns to show the "Malayans" that they were ready for them, but no attack was made, and their alarm must have given way to a feeling of regret at the loss of the supper and the punch which they had left behind. It is noticeable that DAMPIER, in common with other early voyagers, speaks of the excellence of the harbour at Pangkor, and also of the timber. Of the latter he says "the Trees are of divers sorts, many of which are good timber, and large enough for any Use. Here are also some good for Masts and Yards, they being naturally light yet tough and serviceable."

In 1690, one year after DAMPIER'S visit, the Dutch garrison at Pangkor was "cut off" by the Malays under one PANGLIMA KULUP; and in 1693 an order was given that, in consequence of this massacre, no garrison should be posted again at Pulau Dinding, but that a stone pillar should be erected there, having on one side the arms of the United East India Company, and on the other those of the United Provinces. 1690. 1693.

The pillar above-mentioned seems to have been erected, and either to have fallen down or to have been pulled down by the Malays, probably the latter, for in a letter dated 8th August, 1695, an order is given to re-erect it and to clean it yearly and keep it in repair. 1695.

Having thus set up a monument of their occupation—and abandonment—of Pangkor, the Dutch seem to have left the place alone for a period of 50 years. In 1745, however, an order was given to build again a small fort at Pulau Dinding, and to put there a garrison of 30 European and the same number of native soldiers, but *no Bugis*. This order was apparently carried out, but the occupation did not last long, for in 1748 an order was given to remove the garrison on account of the insalubrity of the place, and to send them to Perak. Thus ended the Dutch occupation of Pangkor. 1745. 1748.

How long the stone pillar referred to above was maintained, it is impossible to say; but it may be inferred that some difficulty was found in doing so, for, before leaving Pangkor, the Dutch carved the arms of the United Provinces on a large granite boulder near the fort, which may be seen to this day. There are also traces of an inscription below the arms, but, with the exception of a stray letter here and there, it has been entirely effaced, partly by the action of time and weather, and partly by well-meant but injudicious attempts to clean the face of the rock.

In 1822 Pangkor was visited by CRAWFURD, who found it uninhabited. Having read DAMPIER'S description of the Dutch fort, he searched for it, and found it exactly as described. In 1822.

his account of Pangkor, CRAWFURD specially notices the "beautiful and safe harbour running North and South, and seemingly sheltered from every wind."

We now come to the British occupation of Pangkor. In 1826 that island, together with the Sembilan Islands, was ceded to the British by Perak, with a view to the suppression of piracy; but it does not appear that any use was made of the concession either at the time or for some years after. 1826.

In 1867, a Kedah Malay named Haji MAHOMED AKIB conceived the idea of settling at Pangkor, and applied to the Lieut.-Governor of Penang (Col. MAN) for permission to do so. After some consultation, the authorities being at first doubtful whether it was British territory, he was allowed to settle; a concession of 100 orlongs of land was given to him; and in 1870 he was appointed Penghulu of Pangkor by Colonel (now Sir ARCHIBALD) ANSON. He induced a few other people to join him, but most of them went away again, as Pangkor and Pulau Sembilan were in those days the favourite haunts of pirates, and frequent descents were made by them on the settlers, so that for the first few years Haji MAHOMED AKIB lived almost alone. How he arranged matters with the pirates I do not know, and I never succeeded in getting a satisfactory answer to this question from him; but they do not seem to have visited him as they did other people. I may add, however, that when the Government undertook the suppression of piracy in these waters in earnest, Haji MAHOMED AKIB rendered valuable assistance on several occasions. 1867. 1870.

In January, 1874, the Pangkor Treaty was signed, by which, in addition to Pangkor, a strip of territory on the mainland containing an area of about 200 square miles was ceded to the British Government, and the whole territory was called the Dindings. It was made a dependency of the Settlement of Penang, but it was arranged, as a matter of convenience, that it should de administered by the Resident of Perak, the Revenue and Expenditure being, of course, included in the Budget of the Colony. 1874.

After the Pangkor Treaty, some Police were placed on the

island under a Europeon Sergeant to assist the Penghulu in
keeping order, and in March, 1875, Inspector WARNE was 1875.
sent to take charge of the Station. After remaining there six
months, he was relieved by Inspector COOPER in September
of the same year, and the latter was in charge till April, 1877, 1877.
when Captain LLOYD, who was appointed Superintendent of
the Dindings on the 29th March, took charge.

On the 26th October, 1878, after only eighteen months' 1878.
service, Captain LLOYD was brutally murdered by some of the
Chinese coolies from the Lumut Estate, who, being thrown out
of employment, naturally turned to their favourite pastime of
gang-robbery. The details of this crime are familiar to most
people in the Straits, and I will not dwell on them here.

After Captain LLOYD'S murder, Mr. R. R. BRUCE, then an
Inspector in the Perak Police, was placed temporarily in
charge of the Dindings. He was appointed Superintendent
at the beginning of 1879, and continued to hold that post till 1879.
15th September, 1882, when he nearly lost his life under the 1882.
following circumstances. One Haji OSMAN BIN HASAN had
gone "amok" at Telok Sera and wounded four boys, and had
then been killed by the Penghulu and Assistant Penghulu.
On going into the case, Mr. BRUCE found that one Haji
HASAN, who was then at Taiping, was required as a witness,
and had him brought to Pangkor. On the 15th September,
Mr. BRUCE examined Haji HASAN in the old "balei"
or court-house at Pangkor, Captain LLOYD'S former residence.
Haji HASAN knew nothing of the "amok" at Telok
Sera, and at first Mr. BRUCE did not tell him about it, but
subsequently he did so. One of the boys who had been
wounded was related to Haji HASAN, and the latter seemed
much disturbed and put out by the news. He asked leave
to go at once to Telok Sera and see the boy, but as he was
not reported to be dangerously wounded, Mr. BRUCE told Haji
HASAN he could go as soon as the enquiry was finished. He
said nothing further and seemed satisfied. Shortly afterwards
Mr. BRUCE and Inspector McKEON of the Perak Police adjourned
to an inner room for breakfast. They had not been
there long, when Inspector McKEON happened to look up,

and saw Haji HASAN behind Mr. BRUCE, who was sitting with his back to the door, with a "golok" in his hand, which he was just about to plunge into Mr. BRUCE'S left shoulder. Inspector MCKEON sprang to his feet and seized Haji HASAN by the throat with one hand, while with the other he attempted to seize Haji HASAN'S right hand in which he had the "golok." He was only able, however, to alter the direction of the blow, and Mr. BRUCE received a serious wound in the back, but he undoubtedly saved Mr. BRUCE'S life, for, had he been stabbed on the left shoulder as Haji HASAN intended to do, the wound must have been fatal. Inspector MCKEON then had a severe struggle with Haji HASAN, in the course of which he received an ugly wound in the left forearm, but he eventually succeeded in wresting the "golok" from him, and getting him down in a corner, when the Police came to his assistance. This sudden attack on Mr. BRUCE appears to have been quite unpremeditated. It is probable that the news of the "amok" at Telok Sera upset Haji HASAN'S mental equilibrium and caused him to "amok" himself.

Mr. BRUCE suffered a great deal from the effects of his wound, which obliged him to go to Europe for a change, and ultimately to resign his appointment.

In June, 1883, MR. URBAN BRUCE was appointed Superin- 1883.
tendent of the Dindings, and held that post till 23rd November, 1884, when he met his death through a most unfortunate 1884.
accident in Penang, where he had gone to recruit his health after an attack of fever.

On his death Mr. A. T. DEW, of the Perak Government service, was appointed Acting Superintendent of the Dindings, and was confirmed in the appointment in May, 1886. He re- 1886.
mained in charge of the district till July, 1886, when it was decided by the Government of the Colony to take the administration into its own hands, and an Officer of the Colonial service was placed in charge. By Ordinance XI of 1886, the territory and islands of the Dindings ceased to be a part of the Settlement of Penang and were made a dependency of the Settlement of Singapore. They have since been re-

transferred to the Settlement of Penang by Ordinance IX of 1890.

Although the contemporary history of the Dindings only extends over a period of 17 years, it cannot be said to have been an uneventful one, as two out of the first four Superintendents met their deaths while holding the appointment, and a third was seriously wounded. It is to be hoped, however, that the tragic era has passed, and that a peaceful and prosperous future is in store for a district which, when developed, should be a valuable accession to the Colony.

In concluding this account, it may not be out of place to give a brief description of the district under notice. It consists of Pulau Pangkor, Pulau Sembilan (the Nine Islands), lying about 10 miles to the South of Pangkor, and the strip of territory on the mainland already alluded to, which is bounded on the North, East and South by Perak, and on the West by the sea. The northern boundary is 8 miles in length, the eastern 22 miles, and the southern 5 miles, while the length of coast line, roughly speaking, is between 25 and 30 miles. The area of this portion of the district is about 200 square miles. The island of Pulau Jarra, called by the Malays Pulau Temurah, is also a dependency of the Dindings. It is about half a mile long forming a rounded hill 500 feet high, in the middle of the Straits of Malacca, with 25 to 40 fathoms all round.

It has two rivers—Sungei Bruas at the northern end, a narrow winding stream, which is a good deal used, nevertheless, for bringing down timber and jungle produce from the interior; and Sungei Dinding opposite Pangkor, which for about 15 miles from its mouth is a fine deep river, navigable for the largest vessels. At a place called Kota Siam it divides itself into three branches—Sungei Kota Siam, Sungei Sigari and Sungei Raja Itam—the latter of which is navigable for launches for some 5 or 6 miles above Kota Siam, or about 20 miles in all from the mouth. The late Penghulu, Haji MAHOMED AKIB, is fond of relating how he once piloted H. M. S. *Iron Duke* up to Kota Siam and back.

At Kota Siam there is an old earthwork which, the Malays say, was once occupied by Siamese, who carried on a continual and lively warfare with the Malays under Raja ITAM, whose fort is a little higher up the river, and has given the name to one of the branches.

Two causes have hitherto operated to prevent the river becoming the port of Perak, as it seems intended by nature to be—(1) the fact that it is in British territory, and that the Government of Perak naturally wanted to have a port in their own State; and (2) the entire absence of communication between the river and the interior of Perak. The question of railway communication between the Dindings and Kinta recently engaged the attention of the Government, but has been shelved for the time being owing to the construction of a line from Telok Anson to Tapa.

The coast is bold, and in many places rocky, with fine, sandy beaches, presenting a marked contrast to the Perak coast on either side, of which mud-banks and mangrove swamps are the chief characteristics. A range of hills runs along the coast for nearly its entire length, and also for some distance along the North bank of the Dinding River, the highest point being at Telok Sera. I believe that the height of this point has never been ascertained, as it is not given in the Admiralty chart, which gives the heights of other points, but it cannot be less than 1,500 feet, and I should say is probably more. On the banks of the Dinding River, opposite Pangkor, there are three hills over 1,000 feet in height and several smaller ones. The soil is fertile and well suited to the cultivation of such products as tapioca, pepper, gambier, Liberian coffee, spices, &c. North of Telok Sera there is a considerable tract of fine, low, swampy land suitable for the cultivation of padi, and, I should say, of sugar also, though the latter has not yet been tried. Padi grows excellently there, and if all this land were to be brought under cultivation, a valuable rice crop might be produced.

The chief product of the district has, however, hitherto been timber, of which a considerable quantity must have been exported during the last ten or twelve years. The quantity exported in 1887 was, in round numbers, 2,200 tons. I know of at least one timber merchant in Penang who started on a very small scale on the Dindings some years ago, and who has made a large fortune out of timber. Steps are now being taken to establish forest reserves before all the best kinds of timber are exhausted, for although the district is a small one, it is the only part of the Colony in which there is any extent of forest left.

Tin is the only metal found in any quantity in the district. There are considerable deposits of alluvial tin in three or four places, and experts judge from the appearance of the ore, that it has not travelled far from the lodes. There being no hills outside the district nearer than the main Perak range, it is reasonable to conclude that the lodes are located in the hills at the foot of which the alluvial deposits are found.

The tin has not yet been worked by Europeans, nor, except on a very small scale, by natives, notwithstanding the great facilities that exist in the way of water-carriage. Before the collapse of the tin syndicate, there was every prospect of land being taken up in the Dindings by Chinese capitalists from Taiping (Perak), but the fall in the price of tin caused the scheme to fall through. Round about Telok Sera there are traces in many places of old workings (chiefly *Lampan*), which are said by the Malays to be of Siamese origin.

Gold has been found in small quantities at one or two places, and in Pangkor Island there is place which is still called Telok Klian Mas.

The island of Pangkor is about 12 miles long and 4 or 5 miles wide at the broadest part. It is very hilly, there being three peaks over 1,100 feet high and three over 700 feet. The highest point is 1,313 feet. These figures are taken from the Admiralty chart. There is not much level land, but the soil is good, and many of the smaller hills are well adapted for planting. The headquarters of the district were, till last year, situated on the East side of the island, where there is an excellent harbour, with deep water and well sheltered from all winds. It is well known for the abundance and excellence of the fish caught there, a large quantity of which is cured and exported. A few small steamers call occasion-ally at Pangkor, but the bulk of the trade is carried on by native craft, chiefly Chinese.

The one drawback to this beautiful island is its unhealthiness. From the appointment of the first Superintendent up to the present time, the journals of the officers in charge have been one long record of sickness caused by the malarial fever which seems to have made Pangkor its home, and which spares no one. Judging from appearances, one would say that the island ought to be very healthy, and it is difficult to say what causes the fever. The late Rev. J. E. TENNISON-WOODS, who spent some weeks at Pangkor in 1884, attributed the unhealthiness of the place to the fish-curing which is carried on at Raja Bayang, the principal village of the island. He says: "The effluvium around the village of Raja Byong was unbearable to those who had not been inured to it by previous education. Whenever the wind blew from the village towards our quarters, we had to leave the house. Our Chinese servants, in spite of every prohibition, spread their mats under the bungalow at night, and exposed themselves to the full force of these mephitic breezes. The consequence was that they were all stricken down with fever, and some nearly died. Pankore has the name of being a very unhealthy place, *but the marvel is how anybody lives there at all.* The inhabitants suffer much from what is called malarial fever, *but the malaria here is undoubtedly mephitism from putrid fish offal.*" * This may be true as far as the village of Raja Bayang is concerned, but other parts of the island, where there is no fish-curing, are just as unhealthy, and the cause must, therefore, be sought elsewhere. It is probable that nothing but extensive clearing of the jungle will effect any improvement. The headquarters of the district were moved last year to Lumut at the mouth of the Dindings River, which it was hoped would be a healthier position, but the results of the move have not been very encouraging so far.

The group of islands called Pulau Sembilan lie about 10 miles to the South of Pangkor, opposite the mouth of the

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* Essay on the Fisheries of the Oriental Region, p. 27. The italics are mine.—E. M. M.

Perak River. They are uninhabited, except during the season when the turtles lay their eggs, when the person to whom the right of collecting the eggs is farmed places a few Malays there to see that no poaching takes place, and to collect the eggs. There is excellent water on one of the islands, and in dry weather the Malays from the mainland are very glad to avail themselves of this supply in spite of the distance they have to go for it. I have been told by Malays that there is a cave on one of the islands where edible birds' nests are to be found, but I could never find any one who could show me the entrance. One man said that when the pirates left the neighbourhood they closed up the entrance to the cave with a big stone. If the cave ever existed outside the imagination of the natives, it is probable that this statement is true.

◆

NATIVE NAMES OF STREETS IN SINGAPORE.

ACTING under the powers conferred by section 143 of the Municipal Ordinance 1887, the Commissioners have affixed at the corner of every street in the town of Singapore a board on which is inscribed "the name by which such street shall be known." But, as most of the residents are aware, the names given by the Municipality to the various streets are only used by the European portion of the population, and the Chinese, Tamils and Malays have names for the streets very different from their Municipal titles. In the selection of names for the streets, Chinese names were very properly selected for the Chinese part of the town, and Malay names for many of the streets in Kampong Glam, and one would naturally have supposed that such names as "Hongkong Street" and "Macao Street" would have been adopted by the Chinese, and that the Malays would have had no hesitation in appropriating a name like "Jalan Sultan."

But, whatever the reason may be, the fact remains that the Municipal names are ignored by the natives, with the exception of the police, who are, of course, compelled to learn them. I think, therefore, it will be of interest to give a list of some of the principal Chinese and Tamil names, as the names illustrate, to a certain extent, the characteristics of each nation. For example, what can be more characteristic of the Singapore Tamil than the names he has given to the Esplanade, to Bain Court, and to Tank Road? With regard to the Chinese names, they may, I think, be divided into three classes, *i.e.*, purely Malay names pronounced in Chinese fashion, Malay names translated into Chinese, and lastly descriptive names.

The descriptive names are mostly very good, and while the appropriateness of the name for Church Street may only strike those who are acquainted with police work in Singapore, yet we can all admire the picturesque names for Thomson and Alexandra Roads. I have not attempted to include the Malay names in the list, as Malays take but little notice of streets, and, as a rule, only describe places by *Kampongs*, which are of course well known in the case of Singapore.

I am indebted to my friend Mr. J. O. ANTHONISZ for the list of Tamil names, and I have to thank Messrs. LI A SIK and TAN TIANG SIONG for preparing the list of Chinese names. The Chinese names are given in the list as pronounced by the Hokkien Chinese.

H. T. HAUGHTON.

CHINESE NAMES OF STREETS AND ROADS IN SINGAPORE.

Albert Street. 監公望舊魯 *or* (2) 磨蔴油街

Kam Kong Mang Ku Lu (Kampong Bencoolen). *Or* (2) Boh Mua Iu Koi—"The street where sesamum oil is expressed."

Alexandra Road. 水磨內 *or* (2) 老只脚

Chwi Bo Lai—"The water rice-mill." *Or* (2) Lau Chi Kha—"The foot of the betel-nuts."

Almeida Street. 牛車水戲園後

Gu Chia Chwi Hi Hng Au—"The back of the Kreta Ayer Theatre." "Gu Chia Chwi," literally "water cart," a translation of the Malay name "Kreta Ayer."

Amoy Street. 媽祖宮後 *or* (2) 義學口

Ma Cho Keng Au—"The back of the Ma Cho Temple." *Or* (2) Ghi Oh Khau—"The front of the school," Angus Street. 監公嗎吭呷

Kam Kong Ma La Kak (Kampong Malaka). The same name is also given to Cumming Street, Fisher Street, Kerr Street, Keng Cheow Street, Omar Road and Solomon Street.

Arab Street. 爪亞街

Jiawa Koi—"Javanese Street."

Armenian Street. 成寶新厝後

Seng Poh Sin Chu Au—"The back of Seng Poh's new building."

Bain Street and Holloway Lane. 色仔厘禮拜對面巷

Sek Kia Ni Loi Pai Twi Bin Hang—"The lane opposite the Portuguese Church." "Sek Kia Ni"=Serani.

Balestier Road. * 鵝曹大伯公

Go Cho Tua Pek Kong—"Rochor Temple." "Go Cho" =Rochor.

Bali Lane. 嘛哩內

Bali Lai. "Lai"=inside, off the road. Compare Haji Lane and Shaikh Madarsah Lane.

Battery Road. 土庫後

Tho Kho Au—"Back of the godowns." "Tho Kho"= Godown, literally "earth treasury."

Beach Lane. 鐵巴虱巷

Thi Pa Sat Hang—"Iron market lane."

Beach Road. 小坡海墘 *or* (2) 鐵巴虱口

Sio Po Hai Ki—"Small Singapore's seaside." "Sio Po" ="Small Singapore" (Kampong Glam), in contradistinction to **大坡** "Twa Po"="Big Singapore" across the river. *Or* (2) Thi Pa Sat Khau—"Iron market mouth." The iron market is of course Clyde Terrace Market.

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* Balestier Road called after Joseph Balestier, Consul for the United States of America who died about 1848.

Boat Quay. **淡邦路頭** (2) **十三行** (3) **十八間** (4) **水厝尾** *or* (5) **溪墘**

Tiam Pang Lo Thau—"The place to go for sampans." "Tiam Pang"=sampans. "Lo Thau"=the beginning of the way. *Or* (2) Chap Sa Hang—"The thirteen shops." There is a street in Canton of the same name. *Or* (3) Chap Poet Keng—"The eighteen houses." *Or* (4) Chwi Chu Boi—"Bathing house end." *Or* (5) Khoi Ki—"Stream bank."

Bras Basah Road. **老脚舊間口**

Lau Kha Ku Keng Khau—"Mouth of the old jail." "Kha Ku" literally "ankle chains."

Buffalo Road. **監公加路武**

Kam Kong Ka La Bu (Kampong Kerbau)—"Kandang Kerbau."

Bukit Timah Road. **馬車路尾** *or* (2) **新山路**

Be Chia Lo Boi—"End of the horse-carriage street." Meaning that the road ends at Kranji. *Or* (2) Sin Swa Lo—"Johor Road." "Sin Swa"=Johor, literally "New mountain."

Canal Road. **監公嗎㖨呷港**

Kam Kong Ma La Kak Kang—"The Kampong Malaka stream."

Canton Street. **橫街仔**

Whe Koi Kia—"The small road that crosses," *i. e.*, Boat Quay and Circular Road.

Carpenter Street. **戲舘街** *or* (2) **義福街**

Hi Kwan Koi—"Wayang-house street." *Or* (2) Ghi Hok Koi—"The street of the Ghi Hoks."

Cheang Hong Lim Street. 八間仔

Poeh Keng A—"The eight small houses."

Chin Chew Street. 荳腐街

Tan Hu Hoi—"Beancake street," so called from the beancake sellers who live there. Beancake is called by Babas "Kweh Koyak."

Chin Hin Street. 大坡新街

Twa Po Sin Koi—"The new street of big Singapore."

China Street. 繳間前 *or* (2) 福建義興公司前

Kiau Keng Cheng—"The front of the gambling houses." *Or* (2) Hok Kien Ghi Hin Kong Si Cheng—"The front of the Hokkien Ghi Hin Kongsi."

Church Street 繳間口 *or* (2) 五代天福宮口

Kiau Keng Khau—"The mouth of the gambling houses." *Or* (2) Ngo Tai Tian Hok Kiong Khau—"The mouth of the five generations the Tian Hok Temple."

Circular Road. 十三行後 *or* (2) 十八間後

Chap Sa Hang Au—"The back of the thirteen shops," *i. e.*, the back of Boat Quay. *Or* (2) Chap Poet Keng Au—"The back of the eighteen houses," *i. e.*, Boat Quay.

Clyde Street. 鐵巴虱馬打厝對面巷

Thi Pa Sat Ma Ta Chu Twi Bin Hang—"The lane opposite the iron-market Police Station."

Clyde Terrace. 碗店口

Ua Tiam Khau—"The mouth of the crockery shops." There are many crockery shops in this street much patronized by the Bugis traders. The Malay name is "Jalan Kedei Pinggan Mangko."

Coleman Street. 勗尼新厝後

Hiok Ni Sin Chu Au—" At the back of (Tan) Hiok Ni's new building."

Collyer Quay. 土庫後

Tho Kho Au—" At the back of the godowns."

Commercial Square. 土庫口 *or* (2) 花園角

Tho Kho Khau—" The mouth of the godowns." *Or* (2) Hua Hooi Kak– " Flower garden corner."

Crawford Street. 鵝曹尾 *or* (2) 小坡老巴虱

Go Cho Bue—" The end of Rochor." *Or* (2) Sio Po Lau Pa Sat—" The old market of small Singapore.

Cross Street. 咭嚀仔街

Kiat Leng Kia Koi—" The Klingmen's street," so called on account of the numerous Klings, boatmen principally, who live there.

Ellenborough Street. 新巴虱口

Sin Pa Sat Khau—" The mouth of the new market."

Esplanade. 大葛前草坡

Twa Kok Cheng Chau Po—" The grass field in front of the great Court.

Fish Court. 𡀔嗎班襄巷

Lo Ma Pan Jiang Hang (Rumah Panjang Lane). The " Rumah Panjang" was the old atap building in Rochor Road where the *demi-monde* lived before Fraser Street was built.

Fish Street. 新巴虱邊

Sin Pa Sat Pi—" At the side of the new market."

Flint Street. 土庫尾

Tho Kho Bue—" The end of the godowns."

Fraser Street. 小坡新街

Sio Po Sin Koi—"The new street of small Singapore."

Garden Street and Jedda Street. 鐵巴虱對面巷

Thi Pa Sat Twi Bin Hang—"The lane opposite the iron market."

George Street. 玻璃後順豐街

Po Le Au Sun Hong Koi—"The Sun Hong Street at the back of the Police," *i. e.*, Central Station. "Sun Hong" was a shop formerly in that street and it gave its name to one of the five divisions of the annual Chin Ge procession.

Synagogue Street bears the same name.

Haji Lane. 舊峇厘

Ku Ba Li—"Old Bali (lane)."

Havelock Road. 槓石街 *or* (2) 酒廍路

Kong Chioh Koi—"Break-stone street." *Or* (2) Chiu Long Lo—"Spirits-shed street," so called from an arrack manufactory there.

High Street. 大葛街 *or* (2) 雙井路

Twa Kok Koi—"Supreme Court street." *Or* (2) Siang Che Lo—"Two-wells street," *i. e.*, the two wells at the foot of Fort Canning.

Hill Street. 王家山脚 *or* (2) 吊橋頭

Ong Ke Swa Kha—"The foot of the Governor's hill." Compare the Malay name of Fort Canning—"Bukit Tuan Bonham." *Or* (2) Tiau Kio Thau—"At the end of the suspension bridge," *i.e.*, Coleman Bridge.

Hokkien Street. 造馬車街

Cho Be Chia Koi—"The street where horse-carriages are made."

Hong Lim Quay. 監公嗎吠呷海墘

Kam Kong Ma La Kak Hai Ki—"Kampong Malaka sea beach."

Hongkong Street. 馬交街
Ma Kau Koi—"Macao street,"

Hylam Street. 海南會館後
Hai Lam Hoi Kuan Au—"The back of the Hailam meeting house"

Jalan Sultan. 二十間
Ji Chap Keng—"The twenty houses."

Japan Street. 媽祖宮邊
Ma Cho Keng Pi—"The side of the Ma Cho temple."

Java Road. 小坡打石街
Sio Po Phah Chioh Koi—"Small Singapore cut-stone road."

Kalang Road. 呀哢橋
Ga Lang Kio—"Kalang bridge." The vulgarism of "Gallang Road" evidently comes through the Chinese pronunciation.

Kampong Bharu. 新監公
Sin Kam Kong—"New kampong."

Kampong Glam Beach. 大井脚
Twa Che Kha—"The foot of the big well." There used to be an old well in the middle of the road at Sultan's Gate.

Kampong Java Road. 紅毛塚
Ang Mo Phun—"European tombs."

Kandang Kerbau and Selegie Road. 竹仔脚
Tek Kia Kha—"The foot of the small bamboos." This

name is probably given on account of the bamboo clumps in the neighbourhood.

Killeney Road. 東陵巴虱對面巷

Tang Leng Pa Sat Twi Bin Hang—"The lane in front of the Tanglin market."

Kim Seng Road. 豐典橋

Hong Hin Kio—"Hong Hin bridge." "Hong Hin"=chop of Tan Kim Seng.

Kling Street. 山仔頂 *or* (2) 鐵條脚

Swa Kia Teng—"Small hill top." *Or* (2) Thi Thiau Kha "The foot of the iron pillars." Many iron pillars were used in the construction of houses in this street.

Lavender Street 鵝曹大公司 *or* (2) 菜園內

Go Cho Twa Kong Si—"The big Rochor kongsi." The chief meeting house of the Thien Thi Hoi was in this street.* *Or* (2) Chai Hng Lai, meaning that vegetable gardens are alongside the road. "Chai Hng"=Vegetable gardens; and "Lai"=inside.

Little Cross Street. 縐亞打銅街

Jiowa Phak Tang Koi—"The street of the Javanese copper-smiths."

Lorong Telok. 篾籠街

Bi Lang Koi—"Bamboo basket street."

Macao Street. 玻璃邊

Po Li Pi—"The side of the Police," *i.e.*, Central Station.

Magazine Road. 陳聖王街

Tan Seng Ong Koi—"Tan Seng Ong street." Tan Seng Ong was the ancestor of the Seh "Tan."

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* See "Manners and Customs of the Chinese of the Straits Settlements," by J. D. VAUGHAN, p. 110.

Malabar Street. 舊海南會舘

Ku Hai Lam Hoi Kwan—"The old Hailam meeting-house."

Malacca Street. 老巴虱口 *or* (2) 萬興街

Lau Pa Sat Khau—"Mouth of old market." *Or* (2) Ban Hin Koi—"Ban Hin street," so called from the firm of that name.

Manila Street. 色仔呢街

Sek Kia Ni Koi—"Serani street." Queen Street bears the same name.

Market Street. 中街 *or* (2) 老巴虱口

Tiong Koi—"Centre street." This is one of the divisions of the Chin Ge procession. *Or* (2) Lau Pa Sat Khau—one of the names for Malacca Street.

Merchant Road. 新街口戲園街

Sin Koi Khau Hi Hng Hoi—"The theatre street at the mouth of the new street," *i.e.*, Chin Hin Street.

Middle Road. 小坡紅毛打鐵

Sio Po Ang Mo Pah Thi—"European foundry of small Singapore." The foundry referred to formerly belonged to Messrs. CAZALAS. It now belongs to a Chinese firm, the Ban Hap Kongsi.

Nankin Street. 松柏舘街

Siong Pek Kwan Koi—"Siong Pek Kwan street." "Siong Pek Kwan" was the Keh branch of the Thien Thi Hoi now suppressed along with the other dangerous societies.

Neil Road. 牛車水斜路

Gu Chia Chwi Kia Lo—"The steep street of Kreta Ayer."

New Bridge Road. 新巴虱馬打厝前 *or* (2) 二馬路

Sin Pa Sat Ma Ta Chu Cheng—"The front of new market Police Station. *Or* (2) Ji Ma Lo—" Number two horse way." South Bridge Road being Tai Ma Lo—" The great horse way."

New Harbour. 新監公船澳 *or* (2) 石叻門

Sin Kam Kong Chun U—" Kampong Bharu Dock." *Or* (2) Sek Lat Moi—"Selat passage." Sek Lat=Malay "Selat." Telok Blanga Road bears the same name.

New Market Road. 新巴虱水棚脚

Sin Pa Sat Chwi Pe Kha—" The foot of the bathing house at the new market."

North Boat Quay. 掬霜前

Kek S'ng Cheng—" The front of the ice factory."

North Bridge Road. 水仙門火車路

Chwi Sian Moi Hui Chia Lo—Literally "Water fairy door fire cart road." Hui Chia=steam tram.

North Canal Road. 溝仔墘 *or* (2) 單邊街

Kau Kia Ki—" The side of the little drain," *i. e.*, the old Singapore canal. *Or* (2) Tan Pin Kai—"One side street," so called because there are houses only in one side of the street.

Orchard Road. 東陵巴虱街

Tang Leng Pa Sat Koi—" Tanglin market street."

Outram Road. 時牌坡

Si Pai Po—" The Sepoy's field."

Pagoda Street. 咭嚀仔禮拜後

Kek Leng Kia Loi Pai Au—" The back of the Kling place of worship."

Pekin Street. 衣箱街

I Sio Koi—"Clothing box street," so called from the cabinetmakers living there.

Phillip Street. 老爺宮口

Lau Ia Keng Khau—"Mouth of the Lau Ia temple," *i. e.*, the Teo Chiu temple. "Lau Ia"=grandfather.

River Valley Road. 王家山脚 *or* (2) 龍頭井

Ong Ke Swa Kha—"The foot of the Governor's hill" *i. e.*, Fort Canning. *Or* (2) Leng Thau Che—"Dragon's head well," *i. e.*, the fountain by the side of the road opposite the Ice Works.

Rochor Road. ⿰口路嗎班襄

Lo Ma Pan Jiang—"Rumah Panjang." See Fish Court.

Sago Street. 牛車水戲園前

Gu Chia Chwi Hi Hng Cheng—"The front of Kreta Ayer theatre."

Saranggong Road. 後港路

Au Kang Lo—"The Au Kang road." "Au Kang" is the Kangka at the end of the road.

Selegie Road.

See Kandang Kerbau. Is Selegie the Malay word "Sĕligi," a "wooden-dart'?

Shaikh Madarsah Lane. 新巴厘

Sin Ba Li—"New Bali." Compare Haji Lane, "Old Bali."

Smith Street. 牛車水戲園街

Gu Chia Chwi Hi Hng Koi—"Kreta Ayer theatre street."

South Bridge Road. 大馬路 *or* (2) 漆木街

Tai Ma Lo—"The great horse-way." *Or* (2) Chat Bok Koi "Paint wood street." This last name is however only given to that portion of South Bridge Road lying between Elgin

Bridge and the corner of North Canal Road, and it is so called on account of the numerous painters who live there.

South Canal Road. 港仔墘

Kang A Ki—"The side of the small river," *i.e.*, the old Singapore Canal.

Stamford Road. 流水澗

Lau Chwi Khe—"Flowing water stream."

Sultan Gate. 王府口 *or* (2) 打鐵街

Ong Hu Khau—"The mouth of the palace." *Or* (2) Phah Thi Koi—"The street of the iron-smiths."

Sultan Road. 小坡打鐵街

Sio Po Phah Thi Koi—"Small Singapore's iron-smiths' street.

Tanglin Road. 大東陵

Twa Tang Leng—"Great Tanglin."

Tank Road. 王家山後

Ong Ke Swa Au—"The back of the Governor's hill," *i.e.*, Fort Canning.

Telok Ayer Street. 源順街

Gwan Sun Koi—"Gwan Sun street." "Gwan Sun" was the chop of a firm in the street which gave its name to one of the five divisions of the Chin Ge procession.

Thomson Road. 井水港

Chia Chwi Kang—"Fresh water stream," *i.e.*, the Kalang River.

Tringganu Street. 牛車水橫街

Gu Chia Chwi Wha Koi—"The cross street of Kreta Ayer," *i. e.*, crossing Smith Street and Sago Street.

Upper Circular Road. 馬車街

Be Chia Koi—“Horse carriage street,” so called from the gharry stand there.

Upper Cross Street. 海山公司街

Hai San Kong Si Koi—“Hai San kongsi street,” so called because the meeting-house of that kongsi used to be in the street.

Upper Hokkien Street. 坔巴街 *or* (2) 長泰街

Lam Pa Koi—“Swamp street.” *Or* (2) Chiang Tai Koi—“The Chiang Tai temple street.”

Victoria Street. 後馬車路

Au Be Chia Lo—“The back of horse-carriage street,” *i. e.*, at the back of North Bridge Road.

TAMIL NAMES OF STREETS AND ROADS IN SINGAPORE.

Albert Street. தீமிரித் திடல்

Thîmiri Thidal—“Place where people tread on fire.” The ceremony of walking through the fire in October-November was held in the street.

Arab Street. பூக்கடைச் சடக்கு

Pûkadei Sadakku—“Street of the flower shops.”

Bain Court. புருவன் துரை சாயப்பட்டரை

Brown Thurei Sâyapattarei—“Brown’s carriage painting establishment.”

Bain and Holloway Streets. பாக்கு தோபபு

Pâkku Thoppu—“Betel-nut garden.”

Balestier Road. தண்ணீர் கம்பம்

Thannîr Kampam—"The water kampong," so named as water was conveyed from this place to town for sale.

Beach Road. கடல்கரை சடக்கு

Kadal Karei Sadakku—"Road by the seaside."

Chin Chew Street. ஆராம்பிள்ளை சடக்கு

Arampillei Sadakku—"Arampillei's road."

Clyde Terrace. இரும்பு பாசார்

Irumpu Pasar—"Iron market."

Commercial Square. கிட்டங்கு தெருவு

Kidangu Theruvu—"Street of the godowns."

Cross Street. பால்கடைச் சடக்கு

Pâlkadei Sadakku—"Street of the milk shops." [The Malay name is "Kampong Susu."]

Dhoby Ghaut. வண்ணான் தெருவு

Vannan Theruvu—"Street of the dhobies."

Esplanade. ஜனுவெரி திடல்

January Thidal—"January place" so named from the sports held on 1st January.

Havelock Road. மாசா ஆரா சடக்கு

Masak Ârak Sadakku—"Arrack distilling street." ["Jalan Masak Arak" is the Malay name.]

Kalang Road. காலாங் விளக்கு கூடு

Kalang Villakukhûdu—"Kalang light cage." (Gasometer).

Kampong Kapor. சுண்ணாம்பு கம்பம்

Sunnambu Kampam—"The lime kampong."

Kling Street. கத்திக்கடைச் சடக்கு

Kathi Kadei Sadakku—"Knife shop street." [The Malay name is "Jalan Kedei Pisau."]

Lavender Street. குசத் தெருவு
Kosa Theruvu—"Potters' street."

Mackenzie Road. தண்ணீர் ஆலை
Thannîr Âlei—"Water engine."

Market Street. செட்டித் தெருவு
Chetty Theruvu—"Chetties' street."

Orchard Road (town limit). வயிராகி மடம்
Vairakimadam.—"Fakir's place."

Orchard Road (from Koek's Market to Upper Tanglin). மேட்டு தான்
Māttu Than—"It is high ground."

Pagoda Street. மாரியம்மன் கோயில் பக்கத்து சடக்கு
Mariammen Kovil Pakkathu Sadakku—"The side street by temple of Mariammen."

Queen Street. டோபி கமபம்
Dhoby Kampam—"Street of the dhobies." [The Malay name is "Kampong Dhobi."]

River Valley Road. கல ஆலை
Kal Âlei—"Stone crusher" from the steam-crusher which is kept at the corner of Tank Road and River Valley Road.

Rochor Road. கமமங்காலா பழைய கூத்துமேடை சடக்கு
Kammangala Paleia Kuthû Mâdei Sadakku—"Street of Kampong Glam old Hindu theatre."

Selegie Road (near Mackenzie Road). நாகப்பன் தான்
Nagappen Thân—"It is Nagappen's."

South Bridge Road. கலப்பித்தி கடை சடக்கு
Kalapithi Kadei Sadakku—"Cawker's shop street."

Sultan Gate. இராசா கோட்டை

Raja Kôttei—"Rajah's palace."

Tanglin, Upper. வம்பு மலை

Vampumalei—"Whampoa's hill."

Tank Road. நலலப்பன் தான்

Nallappen Thân—"It is Nallappen's."

Thomson Road. தண்ணீர் பீலி சடக்கு

Thanîr Pîlei Sadakku—"Water pipe Street."

Victoria Street. கமமங்காலா புதுகூத்து மேடை சடககு

Kammangala Puthu Kûthu Madei Sadakku—"Street of Kampong Glam new Hindu theatre."

Victoria Street (lower). போயான் கம்பம்

Boyan Kampam—"Boyan kampong." [The Malay name is "Kampong Boyan Lama."]

Victoria Street (a lane off). பால கம்பம்

Pal Kampam—"Milk village."

Waterloo Street. கிருஷ்ணன் கோவில் சடக்கு

Krishnen Kovil Sadakku—"Street of Krishnen temple."

H. T. HAUGHTON.

NOTES ON A TRIP TO BUKIT ETAM, SELANGOR.

BY

LIEUT. H. J. KELSALL, R. E.

ON the 1st of January, 1891, I started in company with Mr. LAWDER, District Officer at Kajang, for a five days' trip in the jungle. Our destination was Bukit Etam, situated about 25 miles due East of Kwala Lumpur. By road the distance is about 30 miles.

We reached as far as Ulu Langat, a native village about 13 miles from Kwala Lumpur, and slept there that night in the Police Station, a room of which is set apart for the use of travellers. Here we got eight or nine coolies to carry our baggage.

At 7.20 A.M. on the 2nd, we left Ulu Langat. We rode the first 12 or 13 miles to the foot of the hill, there being a good bridle-path, which had been made by Mr. LAWDER for the use of the Resident a few weeks before. Previous to this there had only been a foot-path through the jungle. The path crosses the Langat River at Ulu Langat, and then runs more or less parallel to the left bank of the river, passing for the first two miles through second growth jungle, and now and then crossing a stream by means of a rough bridge. The jungle then becomes more dense, the ordinary lowland jungle, with thick undergrowth, the most striking tree being the beautifulred and orange *Ixora*, the "Jarum Jarum" of the Malays, which here grows to a height of 25 or 30 feet. Three miles from Ulu Langat a path branches off to the hot springs of Dusun Tuah. There are five or six of these springs altogether.

all near the river. One, I am told, actually rises in the bed of the stream. The principal stream rises out of a mass of granitic rock about 20 feet high and 30 or 40 in circumference. Sulphuretted hydrogen is given off in considerable quantities by the springs. The temperature of the water is, I believe, about 180° Fahr., but as I had no thermometer I could not test it myself. Butterflies of several species appeared to like the hot water, for they hovered about and settled on the moist rocks and sucked up the water. Here I got three or four specimens of that prince of butterflies, the beautiful *Ornithoptera Brookeana*, resplendent in black and green velvet. The water of the river here is quite cold and clear like an English stream, and orchids are pretty abundant on the trees. No beasts were seen in the jungle, and only a few birds. One or two red woodpeckers, a few tailor-birds (*Orthotomus ruficeps*) and bulbuls, a solitary pair of crows, and now and then a wagtail were the only representatives of the feathered tribes that were seen.

The Sungei Lui, an affluent of the Sungei Langat, had to be forded three or four times in the course of our ride, but was nowhere much more than kneedeep. On the sandy banks of the river, especially at one place where there were a lot of durian skins, and at moist spots on the paths, numbers of butterflies, principally belonging to the family *Pieridæ*, but including some *Papilios* and others, were seen, and every now and then one of the blues would cross the path with a flash of metallic light, or a big swallow-tail zigzag down the road, or a glorious black and gold *Ornithopteron* come sailing lazily out of the jungle, at one side only, to disappear a moment or two later on the other. Leeches were, as usual, plentiful in this low damp jungle. A beautiful orange-flowered globba (*Globba aurantiaca*) was plentiful along the sides of the path, and I found a single plant of a small-leaved begonia.

At the foot of the hill, where the path to Ginting Peris branches off, we dismounted, and sent our ponies back to Ulu Langat. After a rest of some hours, and tiffin, we started to walk the remaining four or five miles, all of which is uphill and pretty steep. After ascending a short way, a belt of giant bamboos is passed through, and the character of the jungle begins to change. The undergrowth is not so dense. There is also a perceptible difference in the air—there is a freshness in it that that of the low jungle does not possess. The path here zigzags a good deal, owing to the steepness of the hill. At a height of 2,000 to 2,500 feet the jungle becomes more stunted: fewer large trees are seen and magnificent tree ferns reaching a height of 20 or 30 feet are fairly common. The path follows the crest of a spur of the main ridge, till it reaches a small Sakei *ladang*, or clearing, where a bamboo hut had been erected for the use of the Resident when he visited the hill some weeks before. Here there were also one or two deserted Sakei huts—mere attap sheds raised on poles some ten feet or so from the ground—and a small plantation of sugar-cane. Here we spent the night very comfortably, although it was rather cold, and were lulled to sleep by the sweet wild music of the Sakei wind-organs. These are made of long bamboos, in each joint of which is made a small slit. They are lashed upright to the top branches of a tree, and when the wind blows act something like gigantic flutes. The sound they make is weird yet soothing.

On the morning of the 3rd January, we started at 7 A.M., and under the guidance of the only Sakei we found in the place (who informed us that he had been with CAMERON, the well-known Malayan explorer) went to the top of the ridge. All the valleys below were full of white mist, which marked out the courses of the streams, but as this cleared away under the influence of the morning sun, we had a magnificent view—Kwala Lumpur due West, and beyond that Klang Straits, and a little more to the northward Pulau Angsa. By climbing a tree we got a view all round, and found we were at the highest point of the ridge. The hill consists of a hog-backed ridge four or five miles long, running North and South and rising from South to North, with several spurs lying at right angles to it. The top of the ridge is only a few yards wide and the sides slope steeply down. An animal track runs along the crest, and the rocks and roots of trees between which it passes are in many places worn smooth by animals brushing past. There were merely pools of rain water all along the path, and in the mud the fresh track of a rhinoceros. The jungle on and near the summit is entirely different from that lower down. The trees are stunted and gnarled, and they as well as the ground are thickly clothed with luxuriant moss nearly a foot thick and saturated with moisture. From the top of one of the trees I was able to get a view of the twin peaks of Gunong Hantu and Gunong Besar to the North-East, and setting the coolies to work we made a small clearing which enabled us to get a good view of the country in the direction of Kwala Lumpur and Klang to the West, and Ulu Selangor to the North-West, with all the intervening country. The ridge of limestone rocks near Batu stands out distinctly like a great wall or dyke running nearly East and West. While the men were at work clearing, I spent the time collecting plants. Amongst those I obtained, were a *Rhododendron*, a fine *Medinilla* with a pink flower and red undersides to the leaves, *Burmanicea longifolia* with beautiful pale bluish-white flowers hanging in clusters from the top of a stem a foot or eighteen inches high, the glorious *Nepenthes sanguinea* with pouches eight or nine inches in length, a *Sotterila*, and a large number of orchids—23 or more species, including a fine *Cœlogyne* (probably new), one or two specimens of *Spathoglottis aurea*, and several species of *Anectochilus*, one a fine red one with a broad yellow band down the centre, and a green variety of the same, another of a beautiful velvety bronze colour with crimped edges, and another of a deep red-brown with pink edges and undersides. Few birds were seen on the top of the hill. A species of thrush of a uniform dark brown colour, and a few small flower-peckers were almost the only ones. Not having a gun I could not obtain specimens. Insects were not numerous. There were some flies and bees, and I got a single specimen of *Vanessa perakana* and one of *Atella sinha*.

Having brought a good supply of *kajangs*, we made a smart hut about 500 feet higher up than that where we spent the first night, and about half a mile from the crest of the ridge.

The next morning we set the coolies to work again at the clearings on the summit, while we followed up the course of the stream which ran near our camp. The bed was full of large boulders of granite, amongst which the stream eventually disappeared about a quarter of a mile from the crest of the ridge. I got some more orchids and two species of begonia growing on the rocks in the stream. In the gully in which the stream ran grew a very large species of *Amomum*, the fronds of which were 25 or 30 feet long, but I obtained no flowers of it.

By the evening the coolies had made a sufficient clearing to enable us to get a good view of Gunong Besar and Gunong Hantu. The view from the summit was really magnificent, extending over the whole of Selangor, a great part of Jelebu, and part of Sungei Ujong. That night we slept at our new camp, and were glad of a log fire in the evening. Early the next morning we started for Kwala Lumpur, walking the first six miles, and then, meeting our ponies, riding to within nine miles of Kwala Lumpur, where a dog-cart was waiting to take us on.

On the 15th January I started for a second visit to Bukit Etam. This time with only a Chinese boy and a few coolies. I slept, as before, at Ulu Langat for the first night. Having a minimum thermometer with me I was able to take some readings. At 8 p. m. on the night of the 15th, the temperature in the verandah of the Police Station was 68° Fahr. It had been raining all the afternoon since 4 p. m. The following morning the thermometer registered a temperature of 65°. At 7 a. m. it was 72°. This time I walked the whole way, stopping for an hour at the hot springs at Dusun Tuah, in the hopes of taking some more specimens of *Ornithoptera Brookeana*, but I only saw one, which I failed to secure.

At the bank of one of the streams I had to cross, I got a fair number of insects, including two specimens of *Clerome fannula*, several *Papilios*, and *Pieridæ*.

I reached the big hut at the Sakei clearings about 4 p. m.; my coolies about two hours later. They appeared not to be accustomed to hill work, and were quite done up, although they had light loads. The temperature inside the hut at 8.30 p. m was 64° Fahr.

Next morning I started at 6 a. m. and moved up to the upper camp, and started collecting plants. I got a good number, including 25 species of fir and some good orchids, amongst which were a lot of *Anectochlis* similar to those I got on the previous trip; also a good *Bulbophyllum*. I gathered a sack full of orchids for Mr. RIDLEY of the Botanic Gardens, Singapore.

The temperature at 6 p. m. outside the hut was 63° Fahr. The minimum reading on the morning of the 18th was 56°, and at 11 a. m. the temperature was 64°. The thermometer was hung outside the north end of the hut, the hut being on the western slope of the hill. I collected another sack full of orchids, all from the top of the hill. I also found three specimens of a saprophyte—*Thismia aseroe*—and one of my men brought me a small land crab of a reddish-brown colour and about half an inch across. *

Finding my men had run out of rice, and having collected as much as I could carry, I decided to return to Kwala Lumpur that afternoon, and started at 2 p. m. in pouring rain, leaving my men to follow with the baggage. It rained all the way to Kwala Lumpur, which I reached at 9.45 p. m. My men came in the next afternoon.

THE FOLLOWING PLANTS WERE COLLECTED BY LIEUT. KELSALL ON BUKIT ETAM, SELANGOR :—

Dillenia aurea, Sm.
Illicum cambodianum, Kurz.
Pyrenaria Kunstleri, King.
Schima Noronhæ, Var.? In fruit only. The leaves thick, rounded and blunt, with entire edges. Possibly a new species.
Rourea acuminata, Hook.
Allomorpha exigua, Grif.
Sonerila tenuifolia, Bl. A Javanese plant, not hitherto recorded from the Peninsula. [There were also two

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* Since returning to Singapore, I have found a similar one on Bukit Timah.

or three other species of *Sonerila* unknown to me.]

Bauhinia emarginata, Jack.

Argostemma inæquale, Benn. A good find, as it has not previously been found in the Peninsula. It is a native of Java.

Argostemma. Three other species apparently undescribed.

Ophiorrhiza sp. An unusually large species.

Lasianthus sp. nr. *cynanocarpus.*

Cephaelis Griffithii, Hook.

Ardisia villosa, Jack.

Rhododendron malayanum, Jack.

Diplycosia miycrophylla, Becc.

Tabernœmontana javanica, Miq.? A plant much resembling *T. corymbosa,* but with sessile cymes.

Didymocarpus marginata, C. B. Clarke.

D. platypus, C. B. Clarke. I suppose at least that this plant, which I have also from Kwala Lumpur, is this species. It fits the description well, but I have a specimen of what appears to be *D. crinitus* from Bukit Timah, Singapore, where it is common, labelled "*D. platypus*" from Kew. Mr. CLARKE states that the two species are very nearly allied, and as *D. crinitus* is rather variable in form of leaf, these two species may be the same.

D. sp. nov. A most remarkable plant, which is evidently new, but the specimens were all flowerless. The leaves were crowded and resembled those of such a fern as *Polypodium decorum,* being most elegantly lobed and cut, and bright red. The flowers were white. It would be a charming plant for cultivation.

Æschynanthus speciosus, Hook. This plant was also brought by Lieut. KELSALL, having been collected by Mr. SYERS in Ulu Selangor. It is a fine new addition to the Straits Flora, being hitherto only known from Borneo and Java.

Strobilanthes near *Maingayi.* Just the same as a plant so named from Kew, which was collected on Penang Hill by Mr. CURTIS.

Nepenthes sanguinea, Hook.
Elatostemma acuminatum, Benn.
Ficus hispida, Miq.
F. diversifolia, Bl. Two forms were collected—one almost typically the common form, the other var. *lutescens*.
Chloranthus officinalis, Bl.
Podocarpus neriifolius.
P. cupressina.
Spathoglottis aurea, Lindl.
Calanthe veratrifolia, R. Br.
Microstylis acutangula, Hook. The flowers of this were green, not white as described in Flor. Brit. India. Otherwise the plant was similar.
Ærides odoratum, Lour.
Phaius pauciflorus, Bl. Apparently this rare Javanese plant, but the spur of the flower is somewhat larger than in BLUME'S figure. It is the first record of the plant from the Peninsula.
Dendrobium. New species of the *Cadetia* section. Will be described later.
Cœlogyne. New species. A very lovely plant of the *Flaccidæ* group.
C. tomentosa, Lindl.
Cryptostylis arachnites, Bl.
Stenochasma urceolare, Griff.
Alpinia Rafflesiana, Wall. This charming orange-flowered *Alpinia* is not at all common. I only know one other locality for it, viz., at Toas, in Western Singapore.
Globba leucantha, Miq.
G. aurantiaca, Miq.
Susum malayanum.
Scleria malaccensis.
Heptaspis urceolata, R. Br.
Smilax hypoleuca, Mig.
Dianella revoluta, Br.
Burmannia longifolia, Becc.
Thismia aseroe, Becc.

Trichomanes pluma.
Hymenophyllum Neesii.
H. javanicum.
Prosaptia Emersonii.
Thamnopteris nidus-avis var. *phyllitidis.*
Lecanopteris carnosa, Bl.
Oleandra neriiformis.
Calostoma Junghuhnii, Schl. This curious fungus I also met with in the jungle at Pataling near Kwala Lumpur. It is known from Sikkim and Java and Sumatra.

Besides these, there were a number of plants of more difficult orders, which I have not yet identified, and a large quantity of living orchids, which have not as yet shewn signs of flower, some of which will certainly prove novelties.

This list gives a fair idea of the style of the Flora of this high region. There is a large Bornean element in it, but many of the plants are common also to the Perak mountains. The Flora is evidently every rich and interesting, and the collection shows what can be done in a very short and hurried journey by any one possessed of sufficient energy to collect as he goes along.

H. N. R.

ANATOMICAL NOTES ON MALAY APES.

BY

DR. A. KEITH.

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I.—PRELIMINARY.

IN the autumn of 1889 my thoughts were directed towards the Pathology of Fever and Ague. Some years ago, research exposed in the blood an influx of a particular micro-organism during the attack. These microbes may be the actual fever-raising virus; or they may be the producers of the fever poison; or they may only be a concomitant of that poison. Be that as it may, the next important step in the evolution of our knowledge of the disease is to determine on what particular part of the body this poison immediately acts. Symptoms, remedies and alkaloids whose specific actions are known, point to a powerful affection of the great visceral sympathetic system of nerves. This system is probably the butt of the fever poison.

II.—OBJECT OF RESEARCH.

(*a*)—It seemed well worth determining in a more exact manner than hitherto had been done, the anatomical relations of this nervous system, and I selected the quadrumana of this Siamese Province—Bangtaphan—lying at the eastern basis of the Peninsula.

(*b*)—And as about 80% of the natives, along the banks of the river of that Province, suffer to a greater or less degree from enlargement of the spleen, it was of interest to see if the quadrumana kept them company in this. But by confining my attention within so narrow limits, I should have committed great havoc among them for a small result.

(*c*)—So, after I had learned what might be called their normal structure, I looked for variations in their anatomy, and these variations—their amount and kind—signify a great deal.

(*d*)—In the young and almost adult members I observed the later acquired stages of development, to which DARWIN'S Law of Heredity can be applied.

(*e*)—And again, between the species of the same genus there are differences—the result of physiological processes. These are of great interest.

III.—THE QUADRUMANA OF BANGTAPHAN.

A.—*Hylobates lar* (gibbon). (Wa-Wa).

Dissected 2 Adult Females.
1 Adult Male.
1 Fœtus.

I take the white circumfacial ring with the white dorsal aspects of the hands and feet as the distinctive mark of the species. In the three specimens the amount and distribution of the interdigital web varied; so it does in all the species of monkeys I have examined; the colour of hair is of little value, it varies with the sex, it varies with the year, and it varies with the animal's age.

B.—*Papio nemestrinus* (pig-tailed baboon).

Dissected 3 Adult Males.
3 Adult Females.
3 Juveniles.
1 Fœtus.

A stedfast species. It does not answer exactly to the description in MASON'S "Burmah," having the ringed hair, and also a remarkable leonine appearance—in the male only. The baby is of a greyish yellow colour with dark brown hairs along the spine. There is a remarkable resemblance to the young of the stumpy-tailed monkey.

C.—*Papio arctoides* (the stumpy-tailed baboon).

Not nearly so abundant as the last species. Of these, as yet I have made no dissections, but at present I have a couple of tame ones. One is quite a baby with a white face, hair of a dirty yellow hue, and a black stripe down its back, which is spreading laterally.

D.—*Papio cynomolgus* (crab-eating baboon).

Abundant near the sea side. No dissections.

I have had tame specimens of all three species. Mentally they differ immensely. A young female *P. cynomolgus* was full of mischief, fun and fight. *P. nemestrinus* was quiet and retiring, but given to lasting fits of anger; while *P. arctoides* was a most staid individual with a far-away gaze and his whole mind seemed steadily occupied sexually.

E.—*Semnopithecus albocinereus* (Schinz), (steel-grey monkey).

Dissected 13 Adults.
2 Fœtuses.

F.—*Semnopithecus femoralis* (Horsfield), (black monkey).

Dissected 1 Adult.
1 Fœtus.

The fœtus and babies of both are of a dull buff yellow. *S. albocinereus* is anatomically very variable, as one would expect from the immense number of nearly allied species. In Bangtaphan both of these species are very abundant. They have very distinctive cries; that of *S. albocinereus* is a deep guttural ejaculation, while that of *S. femoralis*, though evidently produced in a similar manner, has a distinctive metallic timbre, which medical men would describe as a "cracked pot" sound.

G.—*Nycticebus tardigradus.* (Slow loris).

Rare. No dissections.

Elucidation of some of the details has required dissections of other animals, amongst these :—

1. A young Bornean mias (orang-utan).
2. Galeopithecus volans (2 specimens) (flying lemur).
3. Pteropus marginatus (2 specimens) (bat).

IV.—VARIATION OF THE SPLEEN.

Within the bounds of health, the spleen varies in weight with the phase of digestion and period of the day. But I take it, that an increase of one-third in weight, beyond the average relative weight of an organ, constitutes an abnormal condition of that organ. The accompanying table gives the actual and relative weight in most of the specimens I have examined, and chart I is a more lucid representation of the same. The spleen appears to be comparatively large in the mature fœtus, and enlargements are more common in adult females than adult males. In *Papio* and *Hylobates* the spleen seems to be wonderfully stedfast, while in the genus *Semnopithecus* the variability is great—from .0010 to .0055. But in none could I say there was a resemblance to the human ague spleen. The nearest approach to this condition I have yet come across was the spleen of a young female orang-utan. I have a young stumpy-tailed baboon who suffered at one time greatly from anæmia, his ears and face having the almost characteristic hue of malarious cachexia, but the fluctuations in his temperature were slight—102° to 102.75° F. Another very young stumpy-tailed monkey's temperature is 101.2° F., while the crab-eating monkey has a temperature of 101° F. Thus the results of the enlargement of the spleen, as an indication of fever in the monkeys, are negative.

V.—SOME OF THE VARIATIONS IN STRUCTURE.

In the jungle, remote from reference, it is impossible to give an adequate account of these. I will broadly note the chief ones.

Of the three species I have examined, *Semnopithecus albocinereus* is the most variable; next *Hylobates lar;* while has *Papio nemestrinus* has a wonderfully stedfast structure. One would expect to find variation in those parts or organs:—

1st, which differ in nearly allied species and genera; or
2nd, which have undergone an increase or change of function.

The assumption of the semi-upright position by the lower quadrumana, and the downright position (using downright in distinction to upright as applied to man) by the higher quadrumana (*Hylobates* and *Simia*), has led to a change of function, in degree and kind, of many of the organs of the body. The rough diagrams *a, b, c* and *d* show partly what I mean. From these it can be seen that the line of support is continually changing. Thus the spinal column, especially about the lumbar region, ought to show variations. This position further leads to a change in the mode of respiration, and we ought again to find variations in the bony structure of the chest, as in the sternum cartilages and ribs. And those parts are the most variable in the monkey organism.

(*a*)—*Variations* of the *Sternum*. (Breast-bone).

In the cartilaginous fœtal sternum, centres of ossification appear, and it is the almost universal condition in the mammalian kingdom, for the first centre to spread and form the first piece or manubrium, while the second, third, fourth and fifth may or may not unite to form the sternum. But in the genus *Hylobates* (gibbons) the rule seems to be for the first and second pieces to unite and form the manubrium. Of the four specimens I dissected, two united in this manner (diag. IV), nd two did not (diag. III). Professor DWIGHT called attention to this point (Journal of Anatomy, 1890) and gave the following cases, which I tabulate:—

Specimens in which the 1st and 2nd pieces united to form manubrium.	Specimens in which the 1st and 2nd pieces did not unite.
Hylobates leuciscus, 2 specimens, (Dwight).	Hylobates lar, 1 specimen, (Dwight).
Hylobates varié, 2 Specimens, (Knox).	Hylobates lar, 2 specimens.
Hylobates syndactylus, 1 Specimen.	
Hylobates lar, 2 specimens.	
Total, 7 specimens.	Total, 3 specimens.

Professor DWIGHT gives diag. I shewing the same condition in man, and diag. II shows it in *Hylobates leuciscus*. I found a very close approximation to the same form in a specimen of *Semnopithecus albocinereus* (see diag. VI). Professor DWIGHT is of the opinion that it means nothing more than that nature is on one of her accidental excursions, but the condition seems rather too wide spread for that. The sternum in the quadrumana is in a plastic condition, and the great development of the pectoral muscles—especially the manubrial portion of them—may determine the union of the first and second parts.

The sixth centre of sternal ossification appears late in juvenile life in the *Semnopitheci*, and in one adult it had failed to put in an appearance (see diag. VIII).

(*b*)—*Variations in Ribs and Chest Walls.*

In the same genus the eighth pair of ribs seem undecided whether they should terminate in the fibro-cartilage in front of the xiphoid or not come within an inch of it (see diags. VI, VII, VIII, IX, X). In *Papio nemestrinus* the eighth pair of ribs always reach the sternum (see diag. VIII). In a specimen of *Semnopithecus* the fifth rib terminated in a piece of cartilage to which some fibres of the diaphragm were attached (see diag. VI). In three specimens of the same genus, I came across rib-like developments in the fifth, sixth and seventh costal cartilages (see diag. VIII), and in all the adults, these cartilages were more or less ossified.

There are three floating ribs as a rule in *Semnopithecus*, but in two specimens the tenth rib had joined those above and become a false rib.

(*c*)—*Variations in the Lumbar Region.*

In a fœtus of *Papio nemestrinus*, I found the transverse process of the first lumbar vertebra enlarged and representing a thirteenth rib. It was costal in dimensions and appearance (see diag. XI). There was a similar condition in the second lumbar vertebra of *Hylobates lar*, representing a fourteenth rib (see diag. XII).

In the gibbon the twenty-sixth vertebra affects the chief support of the pelvic bones, while in the monkeys and baboons it is the twenty-seventh. Diag. XV shows the peculiar condition found in one of the *Semnopitheci*, on one side the twenty-seventh as usual is supported by the pelvic bones, but on the other side it is the twenty-eighth, the twenty seventh on that side having a plain transverse process. Professor G. B. HOWES (Journal of Anatomy, July, 1890) shows a similar condition in a frog (diag. XIV). The above-mentioned specimen shows considerable aggregations of cartilage on its twenty-fifth and twenty-sixth transverse process as if at one time they had

had intentions of having connection with the pelvic bones. Such growth of cartilage on the tips of transverse processes is not of uncommon occurrence (diag. XVI). In a fœtus of *Hylobates lar* the transverse process of the twenty-seventh vertebra was in a much further state of development than the twenty-sixth (diags. XVIII and XVII).

In one specimen of *Semnopithecus* the abdominal aorta divided on the twenty-fourth vertebra instead of the twenty-sixth, and smaller degrees of variation are common.

The arrangement of blood vessels in the pelvis is very variable. The insertion of the diaphragm may shift down a vertebra and the muscles arising from the anterior aspect of the lumbar region are also liable to variation.

(*d*)—*Variations in Muscles of the Limbs.*

With the great increase and change of functions in the arms of the *Hylobates,* one would not be surprised to come across variations in the muscles of these limbs. The biceps becomes the great muscle of locomotion, and in diag. XIX we have what might be called the normal condition—one head coming from the coracoid process, the other coming from the top of the glenoid cavity; while in diag. XX we have the glenoid head coming as usual, while the coracoid comes from the edge of the biceps groove. A curious thing, in connection with this, is the transference of the triceps head of the latissimus dorsi to the biceps, thus from an extensor in the monkeys and baboons, it becomes a flexor in the gibbons (*see* diag. XX).

There are also numerous variations amongst the extensor muscles of the forearm and leg, while there are numerous forms of arrangement in the arteries and veins of the lower limbs.

(*e*)—*Variations in the Viscera.*

Diag. XXI shows the appendix vermiformis of the gibbons—long, narrow and worm-like; that of the orang is almost similar; diag. XXII shows that of the pig-tailed baboon, only a contraction of the cæcum; diag. XXV gives the usual form of the cæcum of the *S. albocinereus*, with hardly an appendix at all, but sometimes it resembles that of the pig-tailed baboon as in diag. XXIV.

Sometimes in dissections of the human body we find the kidneys united by an isthmus of renal matter, such an arrangement being called the horse-shoe kidney. Diag. XXVI shows such a variation in *Semnopithecus*. In *Hylobates* (see diag. XXXVII) the thyroid gland has a large isthmus lying in front of the trachea; in *Papio* this isthmus is very attenuated; in *Semnopithecus* it is non-existent, although sometimes a rudimentary one may be met with. The thymus gland sometimes exists in adults, and sometimes is absent in infants.

This is but an introduction to the more superficial variations in the quadrumana. We can never know their correct systematic position, nor the direction of their evolutionary tendency, nor their relations to man and to their brother quadrumana, until these be known. And as the all-pervading tropical jungle is gradually being replaced by a vegetation necessary for the sustenance of increasing humanity, the quadrumana will be replaced by man. The century that will hold the apes in its conservatories of rarities, is not far distant, if coming centuries are at all like the great nineteenth.

VI.—A FEW POINTS IN DEVELOPMENT.

(*a*)—*Ear*.

In each species of quadrumana the ear steadily maintains its characteristics. It attains its full growth long before maturity is reached, and still some of its transformations take place late in adult life. Diags. XXVIII and XXIX are from DARWIN'S well known illustrations showing the occurrence in the human helix of a slight protuberance probably likely representing the aural tip of the lower animals. In *Papio cynomolgus* this tip is large and remains unfolded (diag. XXX). In *Papio nemestrinus* and *Semnopithecus albocinereus* one can see this tip folding in late in fœtal life (diags. XXI and XXXII). In a specimen of *Hylobates lar* this tip was unfolded (diag. XXXII). The aural edge of the orang is folded to a greater extent than that of man and has no lobe, but on the other hand that of the *Semnopithecus* has the lobe and resembles closely the human ear. Man seems to have picked many of his parts in common with several of the quadrumana. The teeth of the *Semnopitheci* are more human than those of the orang.

(*b*)—*The Intertemporal Space and the Temporal Ridges.*

(See diags. XXXVI, XXXVII, XXXVIII, XXXIX).

The intertemporal space is bounded laterally by the temporal ridges from which rise the temporal muscles; in front by the frontal ridges, behind by the occipital ridges, from which rise the occipital muscles. In fœtal life and youth this space covers nearly the whole skull, but as the animal grows older the temporal muscles climb up the sides of the skull, while the occipital scramble up behind and the intertemporal space melts away before them. Thus the temporal ridges may crush it out and meet, as in the adult orang, and form a ridge. As a general rule, it may be taken that *the larger this space the greater the relative size of the brain to the body.* A small intertemporal space means large temporal and occipital muscles; large temporal muscles mean large canine teeth (fighting teeth) or coarse food; coarse food means a big stomach, and a big stomach, as I shall presently show, means a small brain. Keep away the effect of the big canine teeth and this intertemporal space can be formulated so as to give a wonderfully exact indication of the relative amount of brain matter.

But the proper signification of these temporal ridges has an important value in classification. They certainly cannot have any generic value, and little stress can be laid on them as specific distinctions, seeing the ease with which they could be varied and the degree in which they do vary with age and sex. They do not reach their final position until well into adult life.

(*c*)—*Epiphysis of the Bones.*

Take the scapula (shoulder blade) of the young monkeys for instance. Along the base we find a border of cartilage. This border foreshadows the further development the bone is to undergo (diags. XL, XLI, XLII.) According to DARWIN'S Law of Heredity, these borders represent the latest evolutionary acquisitions of the scapula. Thus XL, XLI, XLII represent the latest scapular additions made to *Semnopithecus*, *Papio*, and *Hylobates*. *Semnopithecus* and *Hylobates* have had their infra-spinatus space augmented, giving them increased arm climbing power, while *Papio* has had both supra and infraspinatus enlarged equally, which is probably connected with with their all-fours locomotion on the ground.

The lateral extension of the sternum seems to have a similar meaning. Indeed from the epiphysis we can read the late history of the animal.

Many of the tendinous insertions of muscles in adult life get assimilated with the periosteum of the underlying bones and thus there appears a difference in the adult and fœtal insertion of a muscle. (See diags. XLIII and XLIV).

VII.—A FEW PHYSIOLOGICAL CONSIDERATIONS.

These problems are of even more interest than those of variation and development already given. But to understand their real meaning one must break through the conventional idea of human time. While the clock that marks the progress of things human has moved a century, the pendulum that registers the progress of the things of evolution has but swung a second. The failure to grasp a wider than vulgar view of time has kept many of the conservative naturalists from appreciating the final problems of evolution.

How the Stomach, Brain and Muscles are correlated.

The stomach of the three gibbons weighed, on an average, 903 grains, while on an average their contents (mostly green acid figs) weighed 4,100 grains. Their proportion to the weight of the body was respectively .0110 and .0462. Taking half-a-dozen of the *Semnopitheci*, their stomachs weigh 3,216 grains (relative weight=.0400) and contents 25,000 grains (.3200 of body weight). The table shows this more clearly.

	Body Weight.	Stomach Weight.	Contents Weight.	Relative Weight, Stomach	Relative Weight, Contents
Hylobates lar, 3 Specimens, ...	12.5 lbs.	903 grs.	4,100 grs.	.0110	.0462
Semno. albocinereus, 6 Specimens,	15.4 lbs.	3,216 grs.	25,000 grs.	.0400	.3200

That is, the gibbon carries a diet about one-twenty-fifth part of his weight and spends one-hundredth of his internal economy in carrying it and doing the first part of his digestion. On the other hand, this white-eyed, steel-grey monkey has to perform his locomotion with a diet load nearly one-third of his weight and expends as much as one-twenty-fifth part of his bodily substance on his stomach, as much as he does on his liver.

And it is from the stomach that the brain receives its impulse for work. And the progress is from a plentiful food supply that is difficult of digestion, such as the steel-grey monkey's staple and abundant diet amongst the bamboo leaves, to a scarcer and more inaccessible but more easily digestible food, as the green acid figs, and other fruit foods of the gibbon. On the one hand an intricate, large and expensive apparatus is used; on the other a simpler and smaller organ does the work. The extensive foraging excursions of the gibbon entail much more brain labour than the 'barn-door' feeding of the grey monkeys. The gibbon has added to his brain and subtracted from his stomach. And it was this simple mathematical calculation that brought us to where we are.

Such a statement the facts of the case bear out. We tabulate the brain statistics of the above group of monkeys, and this is how the matter stands:—

	Average Bodily Weight.	Actual Brain Weight.	Relative Brain Weight.
Hylobates lar, ...	12.5 lbs.	1,607 grs.	.0187
S. albocinereus, ...	15.5 lbs.	1,113 grs.	.0120

The relative weight of the brain is in inverse ratio to that of the stomach, the gibbons spending $\frac{1}{50}$ of their tissue on brain + $\frac{1}{100}$ on stomach, while the grey monkey spends about $\frac{1}{90}$ on his brain + $\frac{1}{25}$ on his stomach. Man has reached the furthest point in this direction; he spends about $\frac{1}{150}$ of his economy upon a stomach, he gives about $\frac{1}{50}$ to his brain. In a young rang-utan (7 months), I found the brain weighing one-fourteenth of its bodily weight, while its stomach weighed a little over one-hundredth.

Chart II looks as if it did not bear out the statement that increase of brain means decrease of stomach. The orang is quite out of line, and in connection with this I would point out that the development of the brain seems not to be governed by the law that regulates the growth of other organs. The relative amount of brain matter is greatest in fœtal life; from that point onwards to full growth it diminishes. I tabulate the statistics derived from mother and child in the following species:—

Species.	Weight of Adult Brain.		Juvenile or Fœtal Brain.	
	Actual.	Relative.	Actual.	Relative.
Female Hylobates lar,	1,620 grs.	.017	85 grs.	.12
Semno. albocinereus,	1,160 "	.016	460 "	.060
Papio nemestrinus, ...	1,340 "	.019	1,300 "	.216
Bitch and Pup, ...	1,180 "	.0056	595 "	.0218

Contrast this with the spinal cord development:—

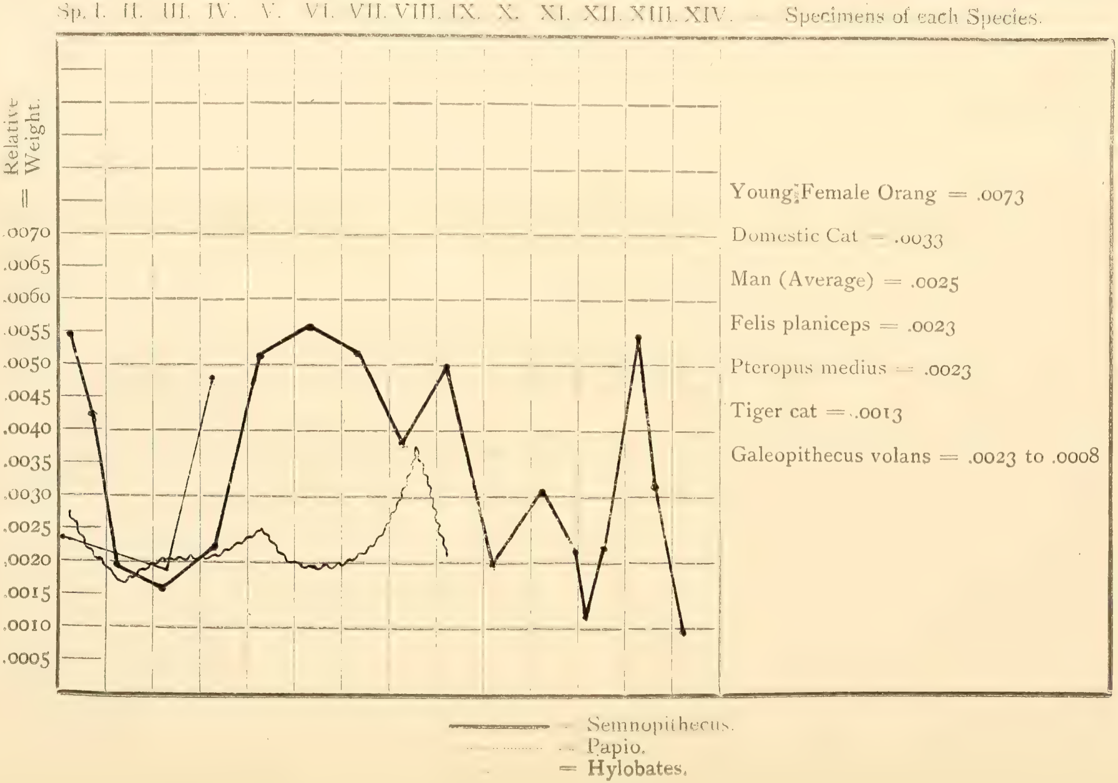
Species.	Weight of Spinal Cord in Adult.		Weight of Spinal Cord in Baby and Pup.	
	Actual.	Relative.	Actual.	Relative.
Papio nemestrinus, ...	175 grs.	.0025	26 grs.	.0040
Bitch and Pup, .	290 grs.	.0014	38 grs.	.00138

The other organs of the body increase much in ratio with the rest; it is so with the spinal cord, but the brain grows with no relation to the state of the other organs, save the stomach.

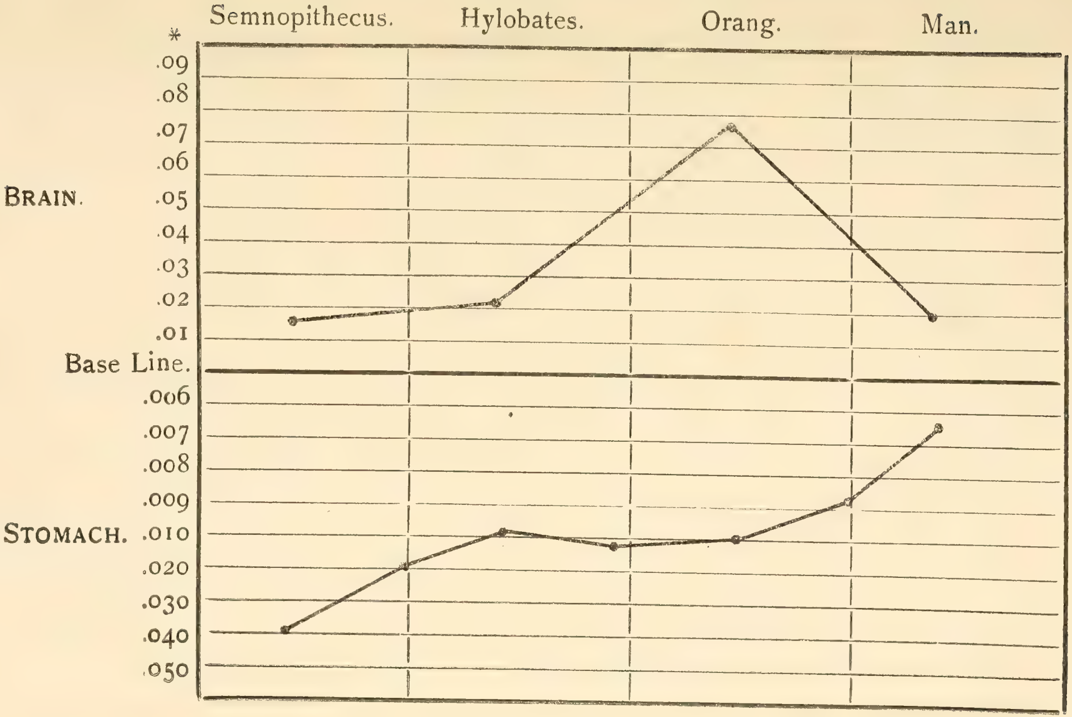
And the greater the cerebal development the greater is its disproportion to the other organs in fœtal life.

I should have liked to give some statements as to the correlation of brain and stomach, or what is the same thing, internal economy with external surroundings, by means of the muscular system, but as my paper has crept to considerable length, I will defer these and some other curious details which I have observed in the quadrumana of this region.

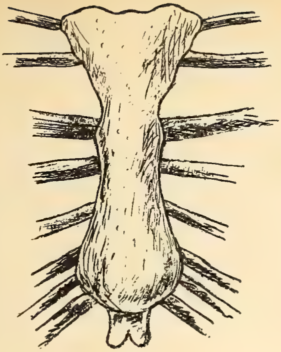
1.—Chart showing Degree of Variation of Weight of Spleen in Quadrumana.



II.—*Chart showing Correlation of Stomach and Brain.*



* Relative Weight of the Brain to Weight of the Body.



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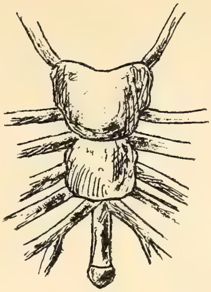

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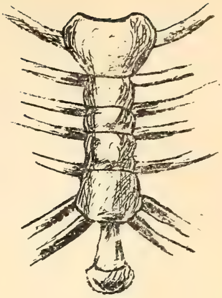

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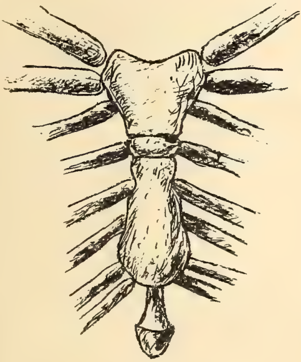

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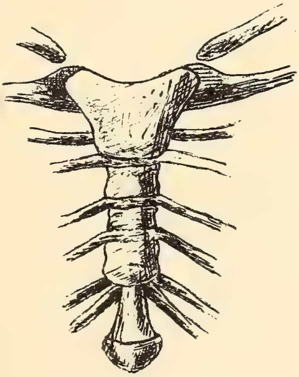

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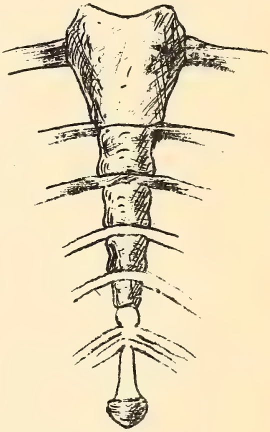

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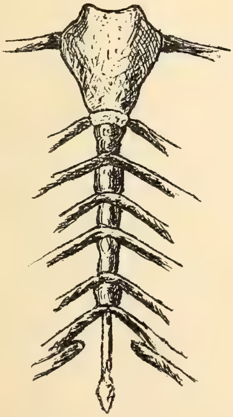

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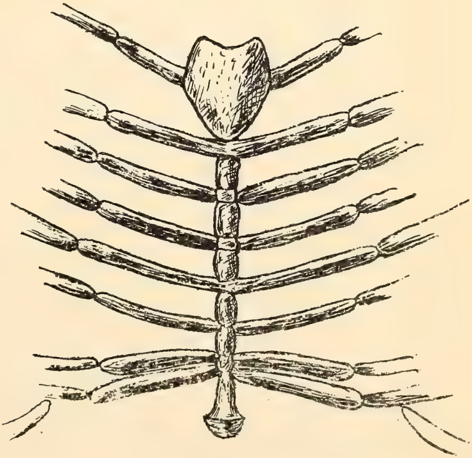

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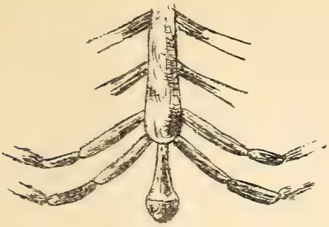

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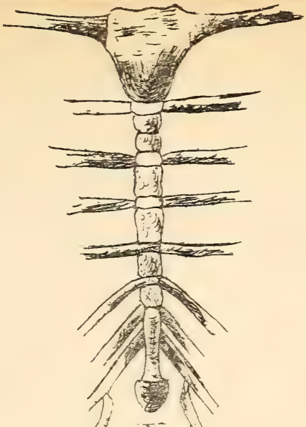

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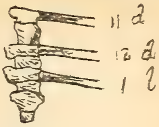

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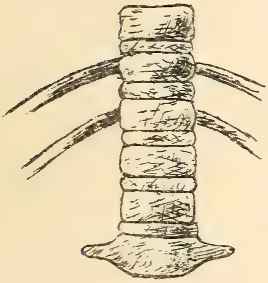

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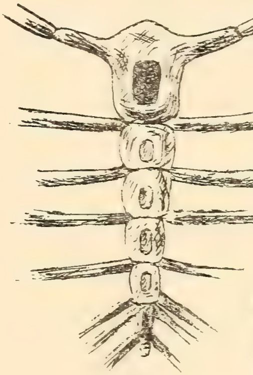

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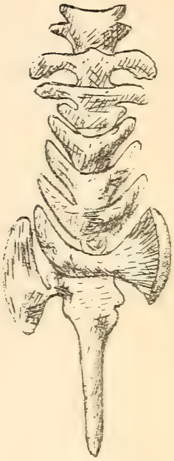

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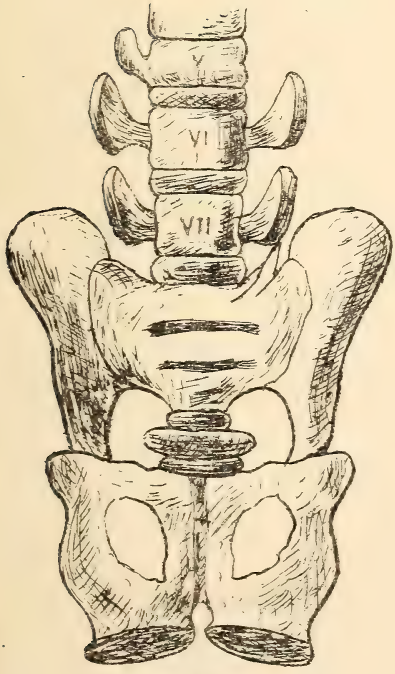

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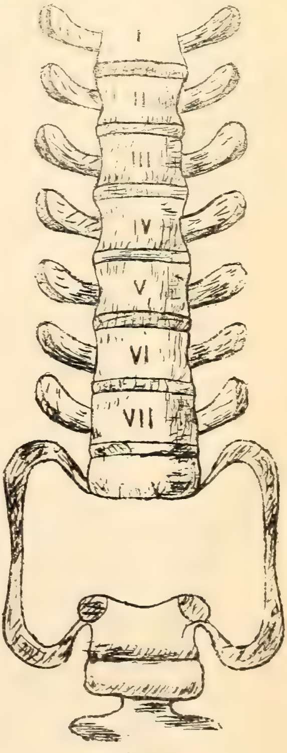
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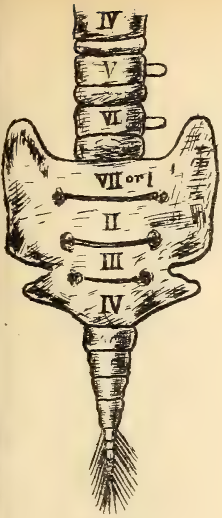
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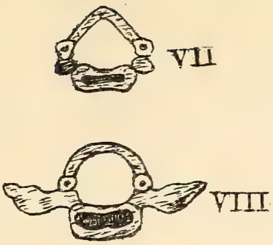

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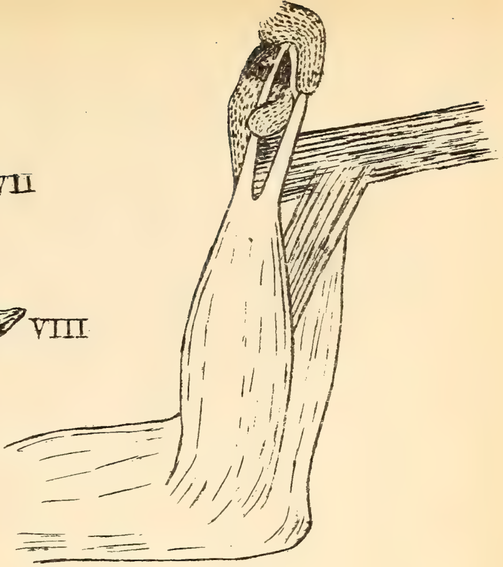

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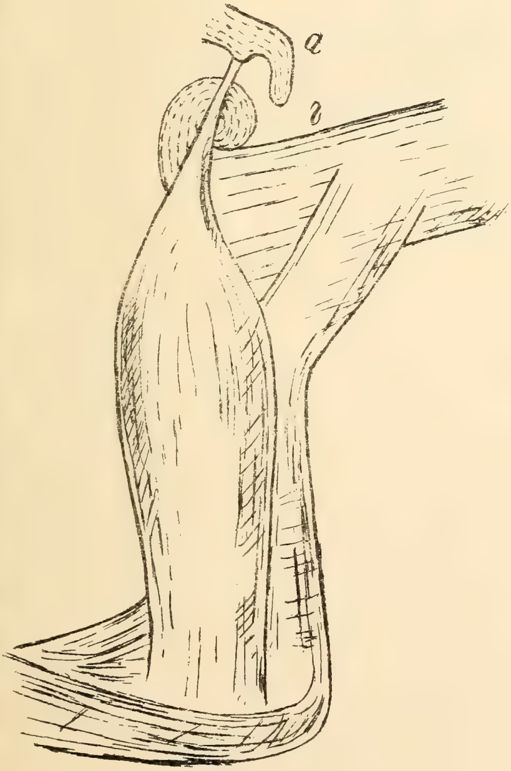

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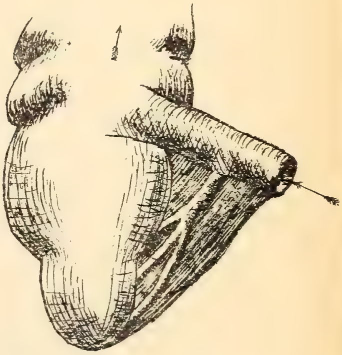

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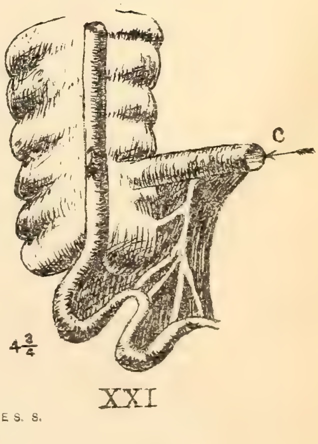

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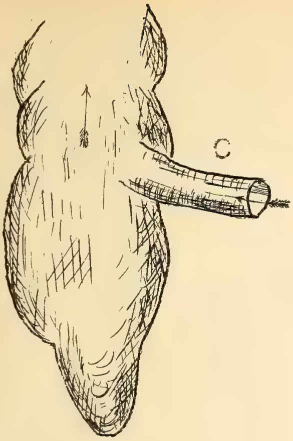

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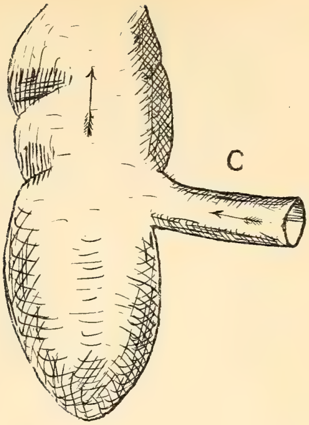

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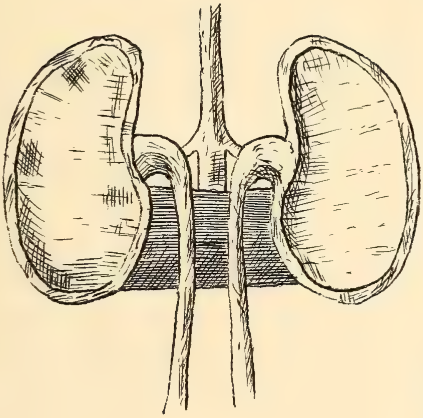

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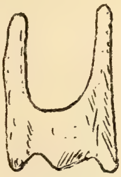
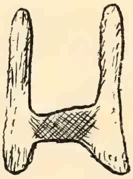
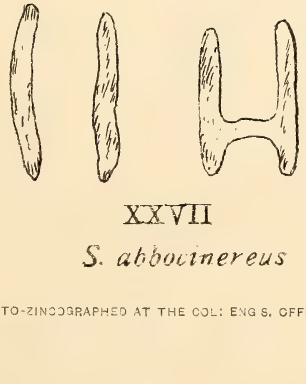


H. lar



P. nemestrinus



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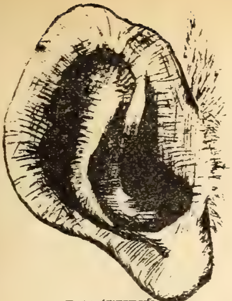

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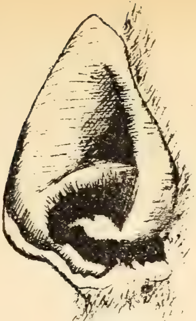

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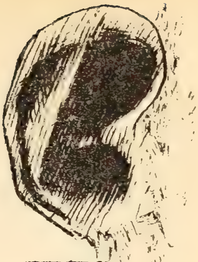

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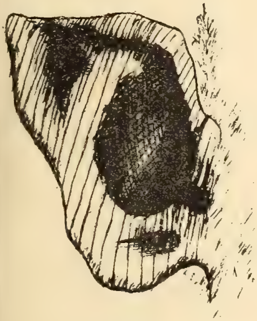

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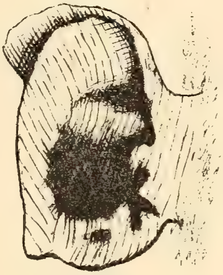

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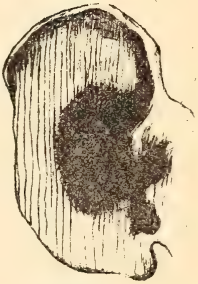

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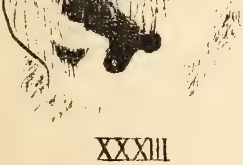

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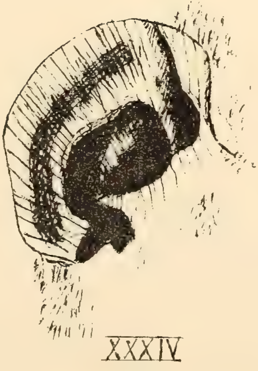

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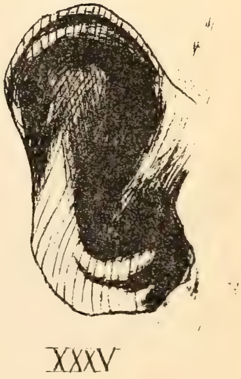

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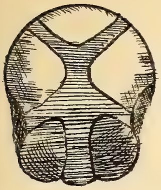

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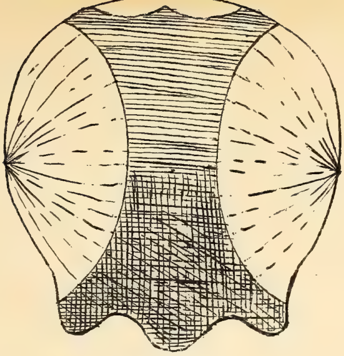

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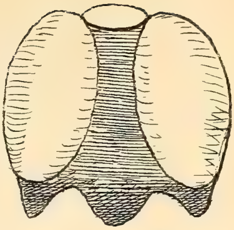

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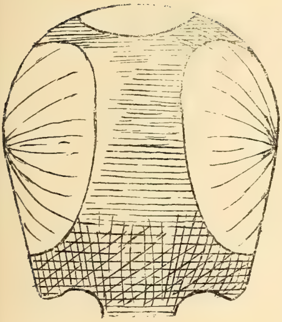

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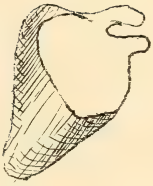

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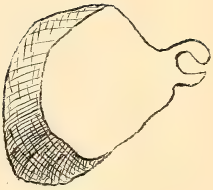

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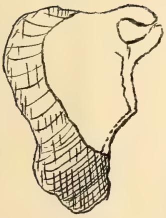

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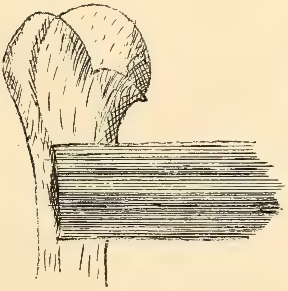

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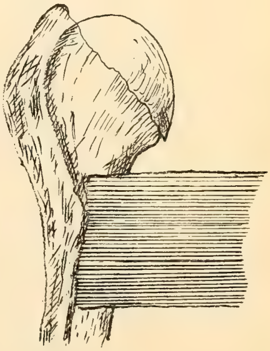

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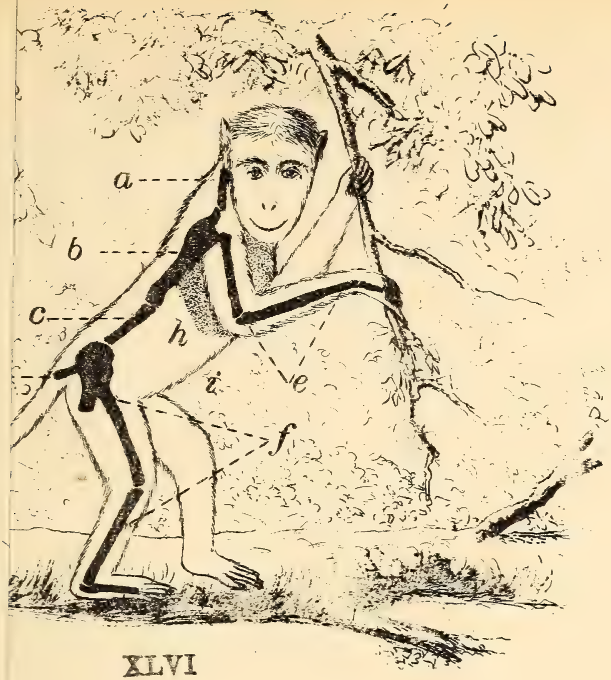

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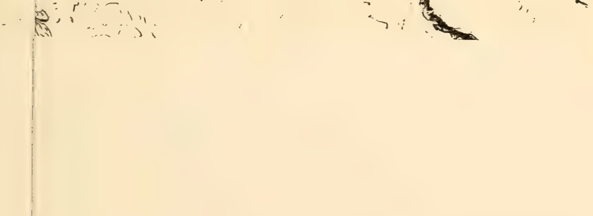

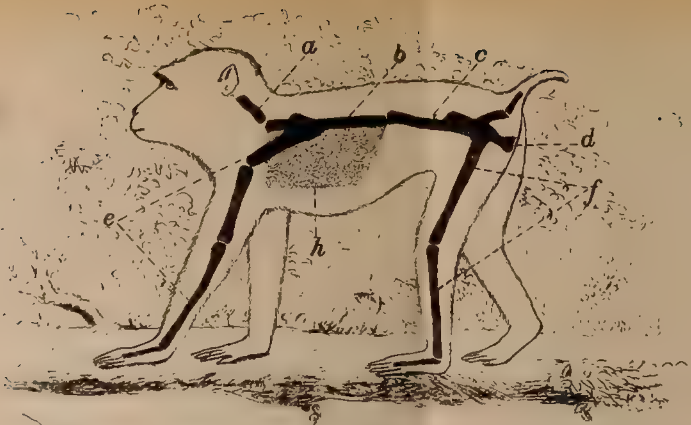

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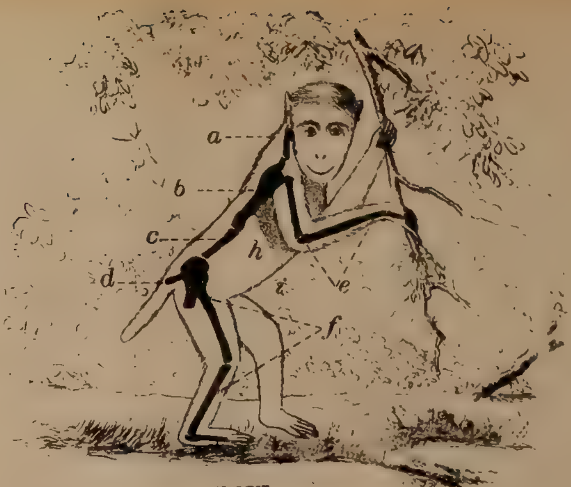

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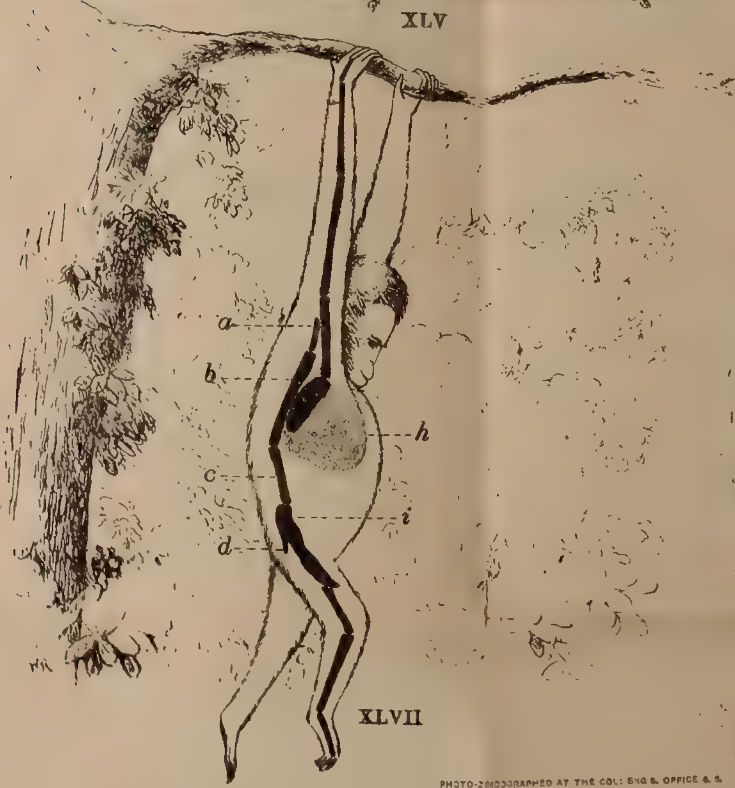

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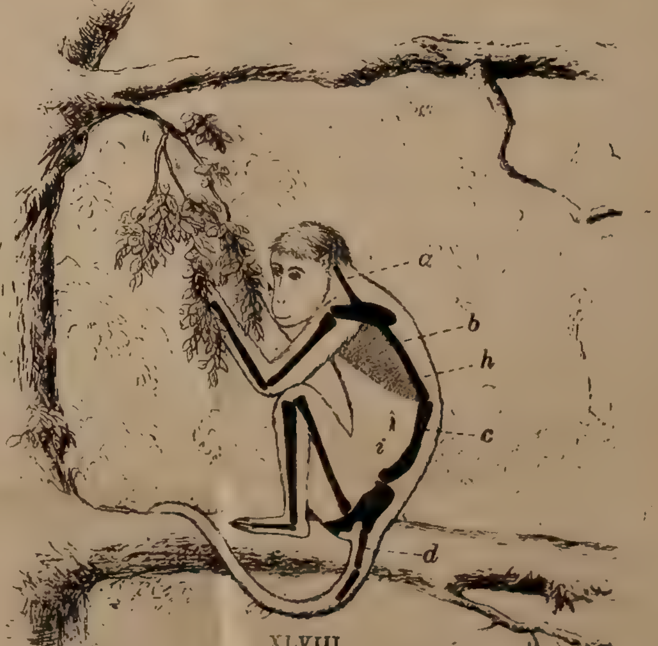


XLVIII

PHOTO-ZINCOGRAPHED AT THE COL: ENG S. OFFICE S. S.

THE FISHING INDUSTRY

OF

KRIAN AND KURAU, PERAK,

BY

A. T. DEW,

Collector and Magistrate and Harbour Master,
Matang and Port Weld, Perak.

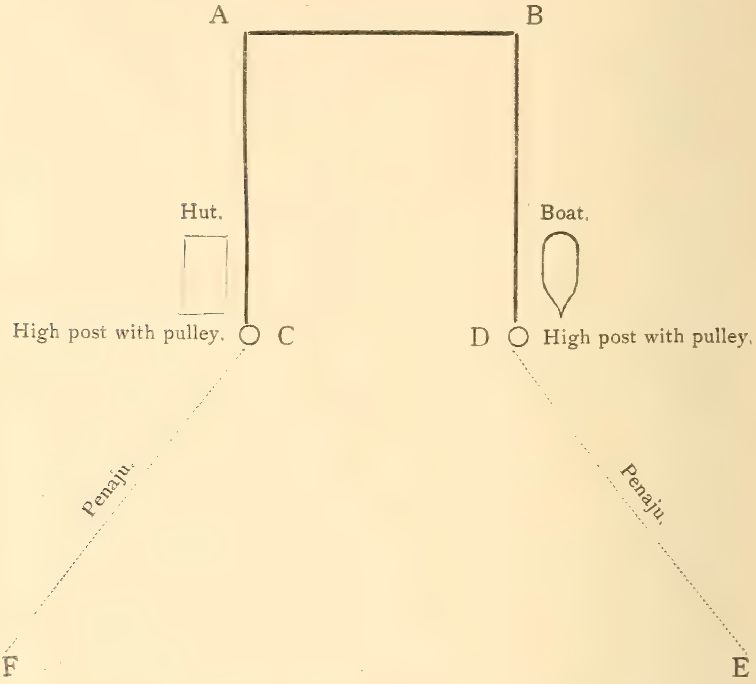
THE Chinese fishing village situated on the South bank of the entrance to the Kurau River is said to have been in existence for more than thirty years. ONG GAN, one of the oldest inhabitants, has lived here for twenty-six years, and there were a good many fishermen then—about 15 houses—and the village has gradually grown to its present size. It now consists of from 70 to 80 houses, with between 450 and 500 Hokkien Chinese, all fishermen, working about 75 nets (*pukat*) and about 140 boats. Besides nets, they at present work fishing stakes (*blat*) as under:—

1 *Blat Jerumal,*
1 *Blat Telok,*
4 *Blat Kedah;* and about
30 *Blat Langei.*

Large fishing stakes will not stand here, as the mud is too soft; they require firmer ground.

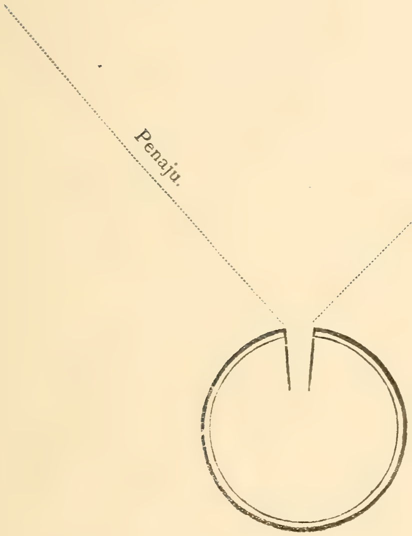
The nets used are of two kinds—*pukat hanyut* (drifting net) and *pukat lengkong* (seine net). Besides these there are the hand nets used by prawn-catchers *(siring udang* and *sungkar udang*). A brief description of these stakes and nets may perhaps be of interest.

Blat Jerumal (an out-shore *blat*).



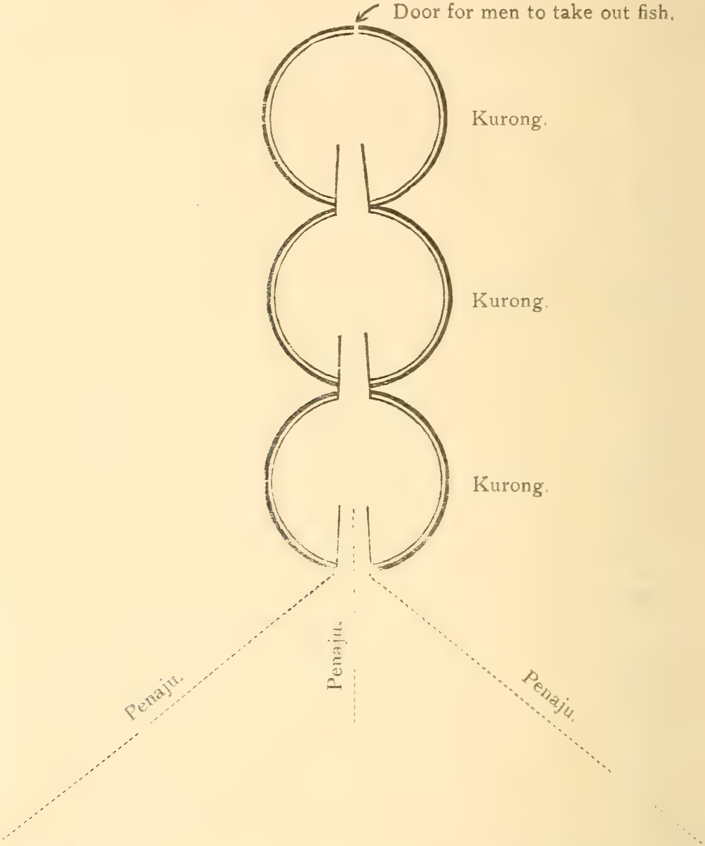
This is made facing the ebb tide. *A B C D,* enclosure of stakes, with a net-work of bamboo or rattan sega round it. *C F, D E,* fences of ditto guiding in the fish. *C D* are high nibong posts with pulleys on top. At the bottom of the enclosure is a rattan net called the "*daun*" (leaf); ropes pass through the pulleys on *C* and *D* and make fast to the outside corners of the "*daun.*" Men watch in the hut at ebb tide, and, when they see enough fish are in, haul up the outer edge of the "*daun*" first, and the fish are caught. The inside end is then raised, and the fish thrown out into the boat, and the "*daun*" again set. This trap is fixed in about 3½ fathoms of water, low spring tides.

Blat Telok (an in-shore *blat*).



Set facing and close to the shore. The water runs out at ebb tide, and the fish all run into the trap. In this trap are caught *Ikan Sembilan, Ketrak, Sablah,* and sometimes prawns. The construction is similar to the *Jerumal,* but the mesh of the net-work is much smaller, and the whole thing is made of much lighter material.

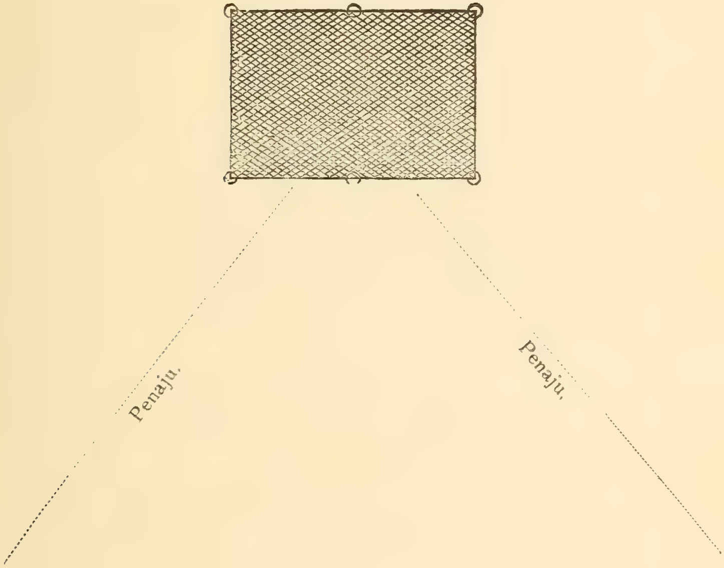
Blat Kedah (an in-shore *blat*). This is a smaller edition of the *Blat Kombang,* and is an in-shore fishing stake.


Door for men to take out fish.
Kurong.
Kurong.
Kurong.
Penaju.
Penaju.
Penaju.

Made of bakau-wood stakes, the net-work of bamboo or rattan sega. Fish enter with the ebb tide, and are then hustled from the first and second *kurongs* into the third with a rattan arrangement called a *sisir.*

It is worked by two or three men.

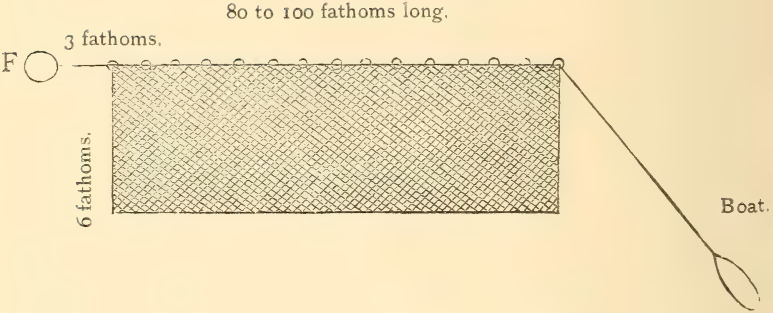
Blat Langei (an in-shore *blat*).



Made of bakau (mangrove) wood stakes. The trap is a string net in the shape of a bag. There are six rattan rings on it, and the net travels up and down on stakes passed through the rings.

A man watches in a boat outside the net, and pulls it up to empty out the fish, and re-sets it; the operation is repeated as long as the ebb tide lasts.

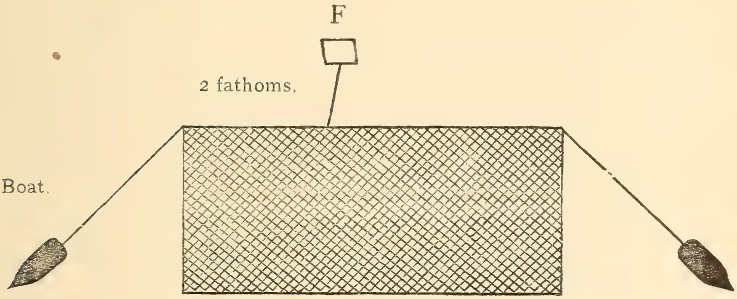
Pukat Hanyut (drift net).



This net is from 80 to 100 fathoms long and 6 fathoms deep, of a mesh (*mata serat*) of about 1½ inches square.

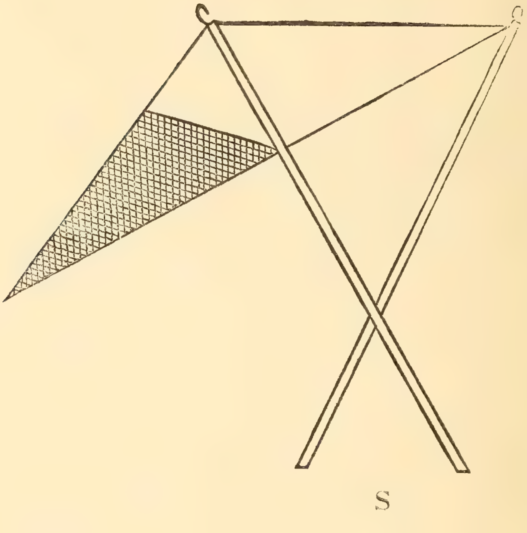
At one end it is made fast to a large float *F* (*polompong*) about 1½ feet in diameter. The other end is made fast to the boat. The net is kept up by floats along the top. It has no weights at the bottom. It drifts along dragging the boat after it, and can be worked in both tides. Only one or two men are required to work it, and large fish are caught in it. The fish strike against it and get entangled.

Pukat Lengkong (seine net).



This net is from 80 to 100 fathoms long and 2 fathoms deep; it has floats along the top, and one large one attached to the centre of the top edge *F* by a two-fathom line; the bottom is weighted with tin. The big float (*polompong*) is first thrown overboard. The net is put out at ebb tide; one end is held by a large boat, and a small boat takes the other end round to the big boat, encircling the fish. The leads must be on the ground, or the fish escape underneath. When hauling the net into the boat, a man goes overboard and gets inside the net to tend the leads, see they do not get foul of sticks, &c., and let the fish out. The mesh is about ½ inch, and all kinds of fish and prawns are caught, though the large kinds are thus caught but seldom, as they frequent the deeper waters. Five men are required to work it.

Siring Udang (hand prawn net).



This is made of coarse cloth (*siring*), has a shallow mouth and a deep bag at the end. It is attached to two sticks crossed as above, and the man, going into the water, places the fork *S* against his shoulder, and pushes it along in front of him on the ground, and the prawns are shovelled into the bag.

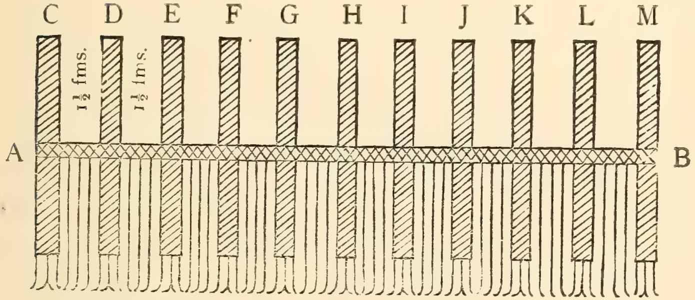
The *Sungkar Udang* is similar but made of string.

These are all the methods, at present in vogue, of taking fish at Kwala Kurau.

I am, however, acquainted with some other methods of taking fish followed in this country, and, as they may be any day adopted here, it may be as well to enumerate them.

The *Blat Kombang* is made on the same principle as the *Blat Kedah*, but is longer, and is an out-shore fishing stake, and will take up to eight men to work it, according to its size. The *Blat Batawie* (out-shore *blat*) is the same as the *Blat Kombang*, only the rattan netting is of a larger, coarser mesh, and is for catching large fish. It is set in channels in about 2 fathoms of water, low spring tides. The *Blat Lengkong* (in-shore *blat*) is the same as the latter, only the netting round it is much finer and closer, being made of *bertam*. With it is caught the *Ikan bunga ayer*, about 1 to 2 inches long, which is very good eating, and fetches, when salted, about 5 cents per catty.

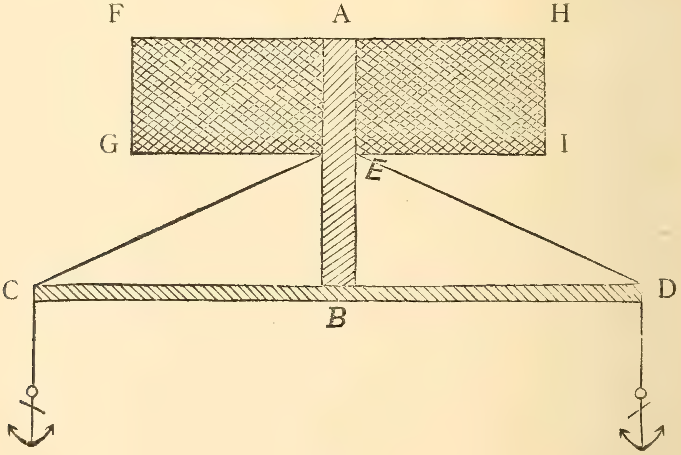
The *Rawei*.



A B is a long rope, running up to 200 fathoms in length. At intervals of about 1½ fathoms are placed bamboos to act as floats, *C D E F G H I J K L M*. From the rope *A B* are suspended, at the end of lines about 1 fathom long, hooks of iron, of a fairly large size; about 10 hang from between each float.

The hooks are unbaited, and the contrivance is either allowed to float about or is anchored at one end. Any *scaleless* fish of a moderate size trying to pass get hooked about the body. Fish with scales, such as the *Selangin*, *Sinahong*, &c., are protected by their scales and do not get hooked. It is set at ebb tide and taken up at flood; two or three men work it in a boat, generally Chinese. With it are caught *Ikan Yu* (shark), *Pari* (skate, three kinds, the black with white spots is the best), *Yu parang* (sword fish), *Duri*, *Goh*, *Bargu*, *Seludu*, *Pelotan*, &c. The last five are all of one family, and are much relished by the Malays. No *Raweis* are used at Kurau, but it is said that at Sungei Magat Aris there are one or two, and I am told they are used in the neighbourhood of Pasir Itam, Larut.

Pompong.



A B C D are two pieces of bamboo fixed to one another at right angles. Hanging from them is a net-work *C E D*, the *Penaju*, guiding the fish, entering by the mouth *C D* into the net trap *F G H I*. It is anchored to the ground, and set at ebb tide. It is an in-shore fish trap.

With the out-shore *blats* are caught *Ikan Selangin*, *Sinahong*, *Barwei* (three kinds, viz., *Barwei chermin*, *Barwei tambar* and *Barwei kedaywas*), *Duri*, *Pupus*, *Pelatar*, *Chincharu*, *Kurau*, *Temeras*, *Siakup*, *Pitcha priok*, &c. With the in-shore *blats* are caught *Ikan Glammar*, *Selangin*, *Chinkárong*, *Pupus*, *Selangat*, *Membeli*, *Udang kertas*, *Kiki*, *Yu*, *Pari*, crabs, &c.

The large *blats*, *i.e.*, *Blat Jerumal*, *Blat Kombang*, and *Blat Batawie*, are owned by and worked by Malays; as is also the *Blat Kedah*. They make them themselves, and sell the fish to the Chinamen at the fishing village. Sometimes they get an advance from one of these Chinamen to assist them in putting up the *blat*, they agreeing in return to sell their fish to or through the Chinaman, the latter taking 10 per cent. of the value as interest, the Malay repaying the original debt out of the price fetched by the fish. The smaller *blats*, *i.e.*, *Blat Telok*, *Blat Langei*, &c., are owned by and worked by the Chinese generally, and they make them themselves. The services of a Malay *Pawang* (sorcerer) are not called into requisition in choosing the sites for these *blats*, but in the case of *Blat Jerumal*, *Blat Kombang*, *Blat Batawei* and *Blat Kedah*, no one would think of commencing one until the spot had been fixed on by the driving of the first stake by a *Pawang Laut* (sea sorcerer) accompanied by the usual ceremonies (*Jamu*). The first is called "*Bacha doa*," in which, after the first stake has been fixed in by the *Pawang*, certain prayers are read from a book by the *Pawang*, the *Pawang* looking towards the prepared yellow rice (*nasi kunyit*) brought for the occasion, the others taking part in the ceremony holding their hands up in praying attitude, and casting their eyes to heaven.

The second is the "*Ratap*," or prayer, or lament, given in chorus, which every one knows by heart.

The third is more "*Bacha doa.*"

The fourth is "*Minta jauh bala, akan datang datang rahamat yang kabejikan*" (asking that bad luck may be far from them and that good luck may befall them).

The *Pawang* then scatters some of the yellow rice on the waters, and the participants in the ceremony then eat the remainder of the rice, and the fowls, which have generally been killed and cooked on shore beforehand.

ONG GAN states that he has never, since he has been here, known the fish to get so scarce at Kuala Kurau as during the last two or three years. AH LIEW and TAN SIANG, also very old inhabitants (the former, the farm agent, has been here twenty-eight years, and is *the* oldest inhabitant), all tell the same story. They cannot account in any way for the fish getting short, but think perhaps it is because there are too many people fishing. Four years ago the place increased very much in fishermen, but during the last two years some have gone away. None of them seem to have any idea when or where the fish breed, or whence or whither they come and go, and when I suggested that if we could find out we should, perhaps, order a close time to give the fish a chance of breeding, they said that would be very hard on them, as what were they to do if not allowed to fish? In fact they want to eat their cake and have it as well. I told them it was done in Europe with good results. ONG GAN says he has only known the fishing get bad like this once before, about twenty years ago. I do not believe this, however, as at Telok Rubiah, about 6 miles further off, I was told it had happened often before, the fish coming and going. I then enquired into the worldly position of the fishermen. They are all Hokkiens, and mostly related to one another. They pay their own passages over from China to join their friends, and then go into partnership with some others in the ownership of a net (*Pukat Lengkong*). Each net is divided into 7½ shares, and there are six men to a net. The owner has 1½ share extra for owning the net, and he works with the other five, and they all, including the owner, get one share each. Thus the owner has altogether 2½ shares. One of the six men stops in the house and salts and dries the fish, cooks the food, &c. The cost of the house, net and boats amounts to about $350, and the owner mentioned above owns the whole concern, including all furniture, tubs, &c.

In good seasons one net (*Pukat Lengkong*) can get fifty or sixty pikuls of salt fish in a month, but in bad seasons as little as eight or ten pikuls.

The fish is classed for export in three classes:—

No. 1.—Dried prawns, which fetch from $7.50 to $10.00 per pkl.
,, 2.—Large dried salt fish fetch from $3.00 to $ 7.00 ,,
,, 3.—Small dried salt fish (for manure) $0.85 to $ 1.30 ,,
Blachan, ... ,, $1.50 to $ 2.50 ,,
Prawn shell manure, ... about 50 cents per pikul.

The fish manure is sold to sugar planters for manuring the sugar-cane, and the prawn shell manure is chiefly used for manuring nutmeg trees, &c.

The men are nearly all opium-smokers, but are extremely healthy and of fine physique, as men employed on the sea generally are; and there is a total absence of those nasty sores and ulcers on the legs, &c., so common among the agricultural and mining coolies.

The fishing is at its best during the 10th, 11th and 12th and 1st Chinese moons, roughly, from November 3rd to March 12th, *i.e.*, during the North-East Monsoon, when it is fine, dry weather with but little wind or storms and waves to interrupt operations. The fishing is at its worst during the 5th, 6th and 7th moons, roughly, from June 9th to September 5th, *i.e.*, during the South-West Monsoon, when it is very wet and windy. Every month no fishing with *pukat lengkongs* can be carried on between the 13th and 21st of the Chinese moon, and between the 28th and 5th, *i.e.*, during the high spring tides; but between the 12th, 13th, 14th, 15th and 16th plenty of fish are to be got in the *jerumals* and *blats*, but not in the *pukats* (both kinds). There is thus a period varying from sixteen to eighteen days every month during which these nets cannot be used.

Generally speaking, the higher the tides get the less fish are to be found. During these periods of enforced idleness the men make and mend their nets, cut their supply of firewood, &c.

They say that the *Ikan kurau* and *Ikan tambrai* have got scarce. It is a big fish, which, salted, fetches eight cents per catty, and in the wet season 12 cents. *Ikan selangin* and *Ikan sinahong* are also getting scarce. I suggested that perhaps the cause of this was that they caught all the young ones, but was told that this was not the case. The parent fish are only, as a rule, caught in deep waters in the out-shore *blats* and *jerumals*. They do not come into the shallow waters, where *pukat lengkong*, &c. are worked, and the young which accompany the big fish can go in and out of these *blats* without being caught.

The people complain of the heavy taxes imposed on their industry. They state that in the old days, under the Sultan of Perak, the first tax imposed was one of $12 per annum on each *pukat lengkong*, paid to the farmer. After two or three years this was found to be too heavy and was reduced to $8. The *jerumals*, *blats*, *pukat hanyuts* and other contrivances for taking fish were all free. No other payments whatever were imposed. The Opium Farmer at Kuala Kurau paid about $100 per annum to the Sultan, and imported and sold as much opium as he liked. He cooked his own opium. There were, however, but few fishermen there then. They now complain that they have to pay one-tenth of the value of their fish to the farmer, pay $10 per annum for every fishing stake, whether large or small, out-shore or in-shore, and that each person using any other means of catching fish must pay for a personal license of $1.20 per annum. Thus the six men manning a *pukat lengkong* each pay $1.20 per annum, total $7.20 per annum, and the two men working a *pukat hanyut* pay $2.40 between them. The *jerumal* and *blat* men, besides having to pay $10 per annum for their *blat* licenses, also pay $1.20 per annum each for a personal license. A *blat* or *jerumal*, requiring, say, six men, will thus cost $7.20 per annum extra. This was levied by mistake by the clerk misunderstanding the rule, and will be refunded to them. Besides this they have to pay 25 cents for a port clearance, whenever their *tongkangs*, laden with fish for export, leave the port, and they have to pay annually for the numbering of each large *pukat* boat 80 cents, for a small ditto 45 cents, and the large and small *sampan kotas* are charged the same. For the numbering of *tongkangs* $1.30 is charged. They also have to pay $1 for the cost of numbering of each *blat* or *jerumat*. They are also charged 10 cents per foot frontage (Land Revenue) for their houses. I should think this, on an average, would come to about $2 per annum per house. This was imposed from January 1st, 1886, and they think it very hard that they should be charged town allotment fees for occupying a part of the useless mud bank of the river.

As regards the payment of one-tenth of the value of the fish to the farmer, they state that they have come to an arrangement with the farmer, by which they pay him $1.40 per month for each *pukat lengkong* instead. If the farmer did this from pure philanthropy it was very good of him; perhaps he came to the conclusion that, if he claimed his full pound of flesh, he would kill the goose that was laying the golden eggs.

It appears that, previous to December, 1885, no licenses were imposed on nets and fishing stakes in the district, though in Larut fishing-stake licenses seem to have been imposed since 1880, but no fishing-net licenses until last year. In that month, however, the Assistant Resident (Mr. CREAGH) issued the order, which I have marked *A*, annexed, and which was issued as a notice by the Magistrate and Collector, Dr. LEECH. The fishermen of this district (and I believe of other districts as well) petitioned against it, with the result that the order was suspended for further consideration, and, after much deliberation, extending over nearly a year, during which period no payments for licenses at all were imposed, the Assistant Resident issued the new order dated 1st October, 1887, which I have marked *B*.

The following table will show the difference between the old and new rules :—

Old Rule dated December, 1885.	$	c.	New Rule dated October, 1887.	$	c.
Large fishing stakes per annum, ...	10	00	Large fishing stakes per annum, ...	10	00
Small fishing stakes per annum, ...	8	00	Small fishing stakes per annum, ...	10	00
Large Pukat (*Lengkong*),	10	00	Say, six men @ $1.20, ...	7	20
Small Pukat (*Hanyut*),	8	00	,, two men @ $1.20, ...	2	40
Prawn (*Siring* or *Sungkar Udang*), ...	4	80	,, one man @ $1.20, ...	1	20
Total,...	40	80	Total,...$	30	80

By the new rules the fees are payable half-yearly.

It will be seen from the above table that the new rule makes a total reduction of 25 per cent. on the old rule.

As regards the statement that the fish has got scarce during the last two or three years, the following totals of exports from Kwala Kurau and Telok Rubiah, taken from the Customs Clerk's book at Kwala Kurau, will show :—

Description.	1885.				1886.				1887.			
	Weight.		Value.		Weight.		Value.		Weight.		Value.	
	Pikuls.	Catties.	$	c.	Pikuls.	Catties.	$	c.	Pikuls.	Catties.	$	c.
Dried prawns, ...	2,771	00	32,116	50	4,414	00	37,993	60	971	00	10,362	00
Salt fish, ...	8,865	00	20,555	30	3,214	00	8,573	40	8,997	75	22,151	40
Blachan, ...	2,383	00	5,527	20	354	50	689	00	455	00	1,242	00
Fish and prawn shell manure,	17,640	00	15,740	10	1,530	00	2,172	00	9,317	00	9,995	00
Totals,...	31,659	00	73,939	10	9,512	50	49,428	00	19,740	75	43,750	40

From this it will be seen that the export of *salt fish* was less than half in 1886 of what it was in 1885, but in 1887 it had risen again to more than it was in 1885.

Dried prawns were nearly double in quantity in 1886 of what it was in 1885, but in 1887 it had fallen to about a third of what it was in 1885.

Blachan was only about one-seventh in 1886 of what it was in 1885, and the quantity had only slightly risen again in 1887, though, from its better quality, it was worth nearly double that of 1886, though it is still less than a quarter the value of that of 1885.

Fish and prawns shell manure was in 1886 only about one-tenth of that in 1885, but again rose in 1887 to about one-half of what it was in 1885.

Comparing the two years, 1886 and 1887, there seems to have been an improvement in 1887 over 1886 under every heading except dried prawns, and the fish about which the people specially complained is more than double what it was in 1886, and more even than it was in 1885. It would, therefore, seem, from this return, that the prawn-fishing is really all they have just cause to complain about at present. I am inclined to think it is only a temporary scarcity; but, if it turns out, after watching the returns for a few more years, to be permanent, I do not think it will be a matter for great surprise, considering the constant shovelling up of these creatures by the million in the *Sirings* and *Sungkars*, besides the large number that are caught in the *Pukat Langkongs* and small *Blats*.

It is only in 1887 that they fell off: had the quantity remained anything like that of 1886, then the total value of the fishery export for 1887, instead of being only $43,750, would have been about $63,000, only $10,000 short of 1885, an increase of about $14,000 on 1886. As it is the grand total for 1887 only shows a decrease on 1886 of less than $6,000.

Prawns are the most valuable product of the fishery, fetching, as I have stated in paragraph 28, from $7.50 to $10 per pikul, and, consequently, a bad prawn year makes an enormous deficit in the fishermen's profits.

Telok Rubiah.

Telok Rubiah, situated on the coast about 6 or 8 miles to the South of Kwala Kurau, is a small fishing village of about eighteen houses, some of which are, however, unoccupied at present, with about thirty-five or forty fishermen—Hokkiens. The oldest inhabitant, KOW CHUNG, the farmer, has lived there for twenty-four years. He states that the fish has been scarce for about two and-a-half years, but he has known this happen before several times, the fish coming and going. Some of the people have, in consequence, gone to Pangkor (Dindings), Bernam, and Lower Perak, until good times return. Before, there were thirty or thirty-five *Pukat Hanyut* nets here, but now there are only seventeen or eighteen. The people here only use *Pukat Hanyut* and *Blat Langei*, no other *Blats* or *Jerumals*; they also use the *Siring Udang* a good deal.

The sea here is constantly encroaching, washing away the land. During KOW CHUNG'S time, the site of the village has had to be shifted four times, being gradually washed away, and they will have soon to move again for the fifth time.

There is no river or stream here, and, after their supply of rain water, kept in tubs, has given out in the dry season, they bring water either from Matang, Larut, or Pulau Jerejak, Penang. The health of the fishermen, like that of those at Kwala Kurau, is very good, the abominable smells proceeding from the fish and prawns in process of being cured, and more especially from the manufacture of *Blachan*, and in the thick of which they live and sleep, having no neutralising effect on the really healthy out-at-sea part of their lives. I think Chinamen like smells, and that they do them good. I have felt before now considerable inconvenience when three miles to leeward of one of these fishing villages, and I unpleasantly remembered my two hours' sojourn in the close atmosphere of KOW CHUNG'S house, surrounded with packages of *blachan*, &c., for days afterwards.

The people here pay no rent to Government for the land on which their houses are built; it would be hard if they did, seeing that the sites of their houses are washed away every few years. Neither do they pay one-tenth of the value of their fish to the farmer. I suppose the farmer could claim it if he liked, but has never yet asked for it. The people here, whit the exception of grumbling a little at the scarcity of fish, and at having to pay for licenses for nets, boats, &c., had little to complain of. The farmer, old KOW CHUNG, however, stated that, in the old days of the Sultan, he only had to pay $1 per ball duty on opium and was allowed to cook it himself. Now he has to pay $7 per ball to the coast farmer. There were no other taxes at all formerly, and now the proceeds of the fishing only produce about $8 per month profit for each man—a large fall from the $20 and more sometimes gained by each in good times, but nevertheless sufficient, I think, to live on comfortably with a little to spare. The farmer has to pay to the farmer at Kwala Kurau $25 per month for his license to sell chandoo. He buys it at $1.35 and sells it at $1.50 per tael. He says he is now losing money, as he only sells about 110 taels per month.

Three years ago the crocodiles were very bad here. One man had his leg bitten very badly and was sent to Penang, where it was amputated, and he is still living and has gone to Trong, Larut, and lives with Malays, attap-making. Three men were afterwards bitten in one day. The Malay paddy-planters at the place (only about seven families) then arranged to call a *Pawang* from Perak to charm away the crocodiles and to bring back the former prosperity to their crops. Each Malay house subscribed 25 cents, and every Chinaman in the fishing village subscribed 30 cents. This was to pay for the buffalo for the sacrifice, the *Pawang's* expenses being paid by the Malays. The son-in-law of the former Datoh ALI of Kurau called the *Pawang*. The ceremony took place, and there have been no crocodiles there ever since and the Malays' crops improved.

There is no separate account kept of the export of fish from Telok Rubiah. They declare their cargoes at Kwala Kurau, running in there to take out port clearances, and the declared amount of fish is entered in the Kwala Kurau book as if it was Kwala Kurau fish.

Tanjong Piandang.

At Tanjong Piandang there is a fishing village of about twenty houses with thirty or forty fishermen. They only catch prawns. About fifteen years ago, in Datoh ALI'S time, there were about two hundred men there, and they used nets also; and people from Nibong Tebal used to come and put up *Blats* there. The people, who had always had the reputation of being a lawless, turbulent lot, and from whose numbers it was notorious that gang robbers, thieves and other criminals were recruited, at last brought matters to a crisis about four years ago by attacking the Police when they came there to make an arrest. As a punishment the Government sent a force of Police there to burn the village down, which was accordingly done. At that time there were about one hundred fishermen. The village has been partially rebuilt, but now, as I have said above, there are only about thirty or forty men, all (but one) Te-Chius. The exception is an old Hokkien, named OOI IN, who has been living there for thirty-nine years and is seventy years old—the oldest inhabitant.

In Datoh ALI'S time the farmer paid $10 per month and was allowed to cook his own opium and spirits. The fishermen then paid no taxes at all.

The people complain that the prawns have got very short in quantity. They have got scarce before, but never to such an extent as during the last four years. They say that, before the last four years, each man could get $6, $7 or $8 profit per month, and that now often they do not get enough to buy sufficient rice to eat. They cannot account in any way for the prawns getting short, but do not think the big fish eat them and cause the scarcity.

There are a good many crocodiles, and perhaps they eat them, they say. A man was killed by one about eight years ago, but no further harm seems to have been done up to about three years ago, since which time two men have been bitten, but no one killed.

Sometimes they get a *Pawang* to come and pray and charm them, and the reptiles get good for a time, but it does not last long.

Like Telok Rubiah, the village has had to be moved a great many times, owing to the encroachments of the sea. The people in this fishing village are not charged house rent by Government, nor does the farmer claim one-tenth the value of the fish taken, as I suppose he might do if he liked.

These fishermen were all originally agricultural *Sinkheh* coolies, and, on their agreements expiring, took to this means of making a living, not being strong men nor fitted for work requiring much strength nor for carrying heavy weights.

(NOTE.—For export returns see table at end.)

Sungei Bharu.

At Sungei Bharu there are only about twenty Chinese fishermen, all prawn-catchers. There were many more formerly, and the people complain of the prawns having got scarce lately. The export return is included in that of Tanjong Piandang.

Bagan Tiang.

At Bagan Tiang is a very small and miserable Chinese fishing village of about fifteen houses. They are all Te-Chius, and work six *Pukat Lengkong* and *Siring Udang*, and carry fish to Parit Buntar for sale. There are only about thirty of these fishermen. There are, however, 19 *Blat Jerumal*, 3 *Blat Kombang*, 1 *Blat Telok*, worked by Malays under advances chiefly to Chinamen in Penang. There must thus be a very considerable amount of fish taken here, and the reason that the export return shows so little is that it is only cured fish that is entered in the export book, and nearly all the fish taken here is taken direct from the *Blats*, &c., over to Penang, and sold fresh, it fetching a higher price than salt fish. Boats also come over from Penang to the fishing stakes, and buy up all they can get and run straight away with it.

Some time ago a small steamer tried its luck in running over here for fish, but I believe it was a losing venture. Some of the fish is also taken up to Simpang Ampat, Nibong Tebal and Parit Buntar and sold fresh.

Many of the people here declare the fish is much scarcer than it used to be. Unfortunately the export return for this part of the district throws no light whatever on the subject, for, as I have said, nearly all the fish is taken away (fresh) without ever being reported.

The export account, such as it is, however, is quite untrustworthy, being kept by careless Malay clerks over whom no supervision seems to have ever been exercised.

For instance, in glancing through the export account book for 1886, I noticed an entry "4,000 catties of dried prawns, value $40." Knowing that dried prawns are worth about $10 per pikul, I at once brought this to the clerk's notice, and he agreed with me, that it was evidently meant for $400. Thus, in this single instance alone, the return shows only one-tenth the value it should have, and, if this is a fair sample of the way the accounts are kept, they are not much to be depended on. The clerk, however, says this mistake was made by his predecessor.

The farmer here does not exact one-tenth of the value of the fish taken, as I suppose he is entitled to do. He would need to be a sharp man to collect it from the *Jerumal* and *Blat* men, who run their fish over to Penang.

Penghulu LEBBY LAH, who has lived there thirty years, says it is always the same, the fish come and go with the seasons (monsoons); that many people declare the fish has got scarcer altogether, but that he cannot tell. If they are scarcer, perhaps it is because there are too many people fishing, he says. People come over from Penang and fish here, and there are all our own coast people at work too.

The Krani tells me that only nineteen licenses to catch fish with hook and line (*panching*) have been taken out. Now, according to Mr. CREAGH'S new regulation (marked *B*, paragraph 2) each person using any other means (besides stakes) of catching fish or prawns is to take out a license, for which he will be charged 60 cents half-yearly. A number of Malays came to me about this when the new regulations were issued, with the usual story about being very poor—*baniak miskin*, &c.,—and that it was very hard lines, &c. I could only explain to them that Mr. CREAGH had taken a whole year to decide about this matter, and that it must, therefore, have been well thought out, and that paragraph 2 was so clear that *every one taking fish by any other means than blats* was to pay 60 cents half-yearly, that they undoubtedly must take out licenses for line fishing (*panching ikan*).

Now, it is ridiculous to suppose that there are only nineteen people line fishing on all this coast, and the inference is that just as many people fish as before, and that the order is simply ignored. The Malays say, with truth, that it is hard that they cannot go out and catch a fish for their dinners without taking out a license; but how is one to draw the line between such cases and those of the people who go out three or four in a boat, say, daily, and who all day long keep three or four lines over the side and take perhaps a pikul of the best fish, *Selangin* or *Sinahong*, &c.? The license only comes to 10 cents per month per man, and the sale of one catty of this fish about pays for it. Besides, the chances are that the man who only goes out, honestly enough perhaps, with the intention of catching a fish for his dinner, is not likely to resist the temptation of catching as many as he can if he finds them biting well. There are, I know, a great many men always employed in this way, and they sell their fish out at sea to the *jerumal* or *blat* men or the Penang boats, and make a good living out of it.

The Malays and Chinese have both conjectured that the alleged scarcity is caused by too many people fishing. If so, to repeal this light tax would act as a further incentive to every man, woman and child to renew their efforts to make matters worse; whereas a little judicious raiding by the Police now and then, leading to the occasional fining of one of the offenders, will, I have no doubt, stop a good deal of it, to the improvement of the fishery for those who invest capital in it and make a regular business of it, and to the increase of the revenue. I do not see any reason why the trade of the regular professional fishermen, Chinese and Malays, who pay their taxes and other licenses honestly for their privileges of using nets and fishing stakes, should be ruined, or, let us say, damaged, by men paying nothing.

Final Remarks.

If any reliance can be placed on the Kwala Kurau export account above, it would seem that the actual quantity of *fish* has not much, if at all, fallen off in this district, but that the *prawns,* the most remunerative part of the fishery, have decreased very much during the last two years, but that there is nothing to show whether the decrease is of a permanent or only of a temporary nature.

If, in the course of two or three years more, the decrease is found to be of a permanent nature, the nature and habits of the prawn in these seas will have to be studied, in order to protect it and encourage its breeding, if necessary by establishing a close season and the same will apply to the fish, if it also should get alarmingly scarce.

However, notwithstanding the favourable aspect of the salt fish return in the Kwala Kurau book, there is no doubt that there is a general complaint of the scarcity of fish throughout the district, whether wholly true, partially true, or false, I cannot say, but I am inclined to think that there is a good deal in it, as I hear the same report from Penang; and, when on a recent visit to Pangkor, I was told that there had been a great scarcity of fish ever since I gave up charge of the Dindings, in the middle of 1886, and there are now not half the number of fishermen there that there used to be.

I would suggest that *Outshore Stakes, i.e., Blat Jerumal, Blat Kombang*, and *Blat Batawei*, should not be fixed in depth of more than 3½ fathoms (low water spring tides), nor should each fishing stake be situated at less than 400 fathoms from any other fishing stake, nor should it exceed 300 fathoms in length.

Inshore Stakes, i.e., every other kind of stakes, also *Pompongs*, should not be fixed in a depth of more than 2½ fathoms (low water spring tides), nor should each fishing stake be situated less than 200 fathoms from any other fishing stake, and should not exceed 120 fathoms in length.

It will be seen that an outshore *blat* is more than twice the length of an inshore *blat*, and it is, therefore, only fair that the same charge should not be made for both.

I would further suggest that the use or possession of the murderous *Rawei*, with its 1,000 or 2,000 hooks, should be made illegal.

ARTHUR T. DEW.

KRIAN, PERAK,
21st April, 1888.

$\frac{1204 \; \& \; 1205}{85.}$

A.

Notice is hereby given that all fishing stakes and nets on the Coast of the Krian and Kurau Districts will be licensed from the 1st January, 1886, at the following rates :—

Fishing stakes	(large) and seine nets,	$10.00	a year.
,,	(small)	$ 8.00	,,
Pukat nets	(small)	$ 8.00	,,
Prawn nets		$ 4.80	,,

The boundaries of the district are as follows :—

On the North a line in continuation of the boundary ditch, and on the South a line running due East from the most Southern point of Tanjong Blanga.

Any person wishing to erect a permanent fishing stake must obtain permission of the Chief Officer of the District before doing so. Any person found fishing within the above limits without a license will be prosecuted.

C. LEECH,
Collector and Magistrate, Krian.

Krian, 16th December, 1885.

B.

Government Notification.

1. Owners of fishing stakes, as at present, to pay $5 half-yearly for each set of stakes, without regard to the number of men employed.

2. Each person using any other means of catching fish or prawns to take out a license, for which he will be charged 60 cents half-yearly.

3. This license to be not transferable, and to entitle the holder to fish with any kind of net he pleases, fishing stakes excepted.

4. Any breach of the above rules to be punishable with a fine not exceeding $25 or three months' rigorous imprisonment.

5. Every fisherman to be required to have his license on his person while fishing or in the boat he is using.

6. Any breach of rules to be punishable with a fine not exceeding $5 or 14 days' rigorous imprisonment.

7. Every one in a fishing *kongsi* except the cook to be held a fisherman and required to have a license.

C. V. CREAGH,
Assistant Resident, Perak.

ASSISTANT RESIDENT'S OFFICE,
Perak, 1st October, 1887.

Comparative Statement of Export of the undermentioned Articles for the years 1885, 1886 and 1887.

District.	Description.	1885.			1886.			1887.		
		Weight.			Weight.			Weight.		
		Pikuls.	Catties.	Amount.	Pikuls.	Catties.	Amount.	Pikuls.	Catties.	Amount.
				$ c.			$ c.			$ c.
B. Tiang, ...	Blachan, ...	727	00	985 50	13	00	...	...	...	...
T. Piandang, ...	Do., ...	47	00	118 00	11	00	16 50	76	00	228 40
B. Tiang, ...	Dried Prawns, ...	87	50	914 60	113	06	114 00	63	08	617 00
T. Piandang, ...	Do., ...	277	64	3,172 50	53	00	1,397 92	229	50	3,106 60
B. Tiang, ...	Salt Fish, ...	9	00	6 00	41	00	89 75	123	50	895 50
T. Piandang, ...	Do., ...	27	00	66 00	44	00	288 75	118	30	589 10
B. Tiang, ...	Fish & Prawns Manure,	...	...	...	...	...	38 40	...	...	...
T. Piandang, ...	Do., ...	...	...	...	...	...	...	...	...	...
Total,...		1,166	14	5,262 60	275	06	1,945 32	610	38	5,436 60

A DAY AT CHRISTMAS ISLAND

BY

H. N. RIDLEY, M. A., F. L. S.

IN a naturalist's eyes there is always a peculiar interest attaching to an oceanic island. For, owing to its isolation, we are able to obtain many clues to obscure points in the distribution and development of species, by investigating its fauna and flora.

In speaking of an oceanic island, I mean one which has, as far as we know, arisen by volcanic or other action from the sea, and is not merely a detached portion of an adjacent continent, or of a continent which has in lapse of time been destroyed. Under this category come most, if not all, of the chain of islands which lie scattered throughout the Atlantic Ocean far away from land, such as the Azores, Canaries, Madeira, Cape Verde, Fernando de Noronha, St. Paul's Rocks, Tristan d'Acunha, St. Helena, South Trinidad and Martin Vaz, the Crozets, Diego Garcia, and, farther East, Cocos and Christmas Islands. The plants and animals inhabiting nearly all these islands have now been pretty well explored, and good accounts, especially of the plants, have been published by various travellers and naturalists. Mr. HEMSLEY has collected all the work done on the botany of these islands, and added much thereto in the great work of "The Voyage of the *Challenger*." One or two, however, remain to be more thoroughly examined, as at present but little is known of them. These are South Trinidad and its companion Martin Vaz lying off the coast of Brazil, and Christmas Island, now a British Colony attached to the Straits Settlements.

Christmas Island was visited by H. M. S. *Flying Fish* in 1887, and by H. M. S. *Egeria* in the year 1888, and Mr. J. J. LISTER, who remained on the island for a week, made considerable collections of the plants and animals there, accounts of which were published in the Journals of the Linnean and Zoological Society. Much, however, remains to be done, and it was with great pleasure that I found myself last August in H. M. S. *Redpole* bound for Christmas Island. Unfortunately the vessel was only able to remain there for the inside of one day, so that I could not get more than a glimpse of its flora and fauna. Many of the trees and shrubs were out of flower at that time too, so that I was unable to get specimens of them. I managed, however, to make several additions to the list of plants published by Mr. HEMSLEY from Mr. LISTER'S collections. Among the most interesting of which was a very pretty new orchid, *Saccolabium archytas.*

Viewed from the sea, near Flying Fish Cove, the island appeared as a long straight ridge rising abruptly from the sea, and densely covered with high forest, the deep green of which is dotted with white specks—the innumerable nesting seafowl—while here and there are orange-red patches of the bloom of a handsome coral-tree (*Erythrina*).

The whole island is about nine miles across, and its highest point is nearly 1,200 feet above sea level. The cliffs are mostly abrupt, but in some places are patches of beach, composed of broken coral, shells and stones. The surrounding seas are very deep, and there are but few spots shallow enough for anchorage of a large ship.

On the beach at Flying Fish Cove, Mr. ANDREW ROSS has established his little colony, at present consisting of 15 persons, and is cultivating coffee, coco-nuts and vegetables, for which purpose the brown soil saturated with guano is well suited.

The core of the island is said to be composed of volcanic rock, and I saw a few pebbles on the beach consisting of some kind of trap, but though I ascended to the top of the ridge, I saw none of the rock *in situ.* The whole island is covered with coral-limestone, a hard yellowish rock emitting a ringing sound when struck. In many places it occurs in the form of cliffs rising one above the other, shewing that the island has been slowly and gradually elevated from the sea bottom. Where the upper surface is exposed it weathers into pinnacles and curiously shaped angular projections, and though weathering externally into holes, the inner portions are usually homogeneous. I did not see any fossils in it, but the distinguishable remains of shells and coral would probably be found, if sought for.

Exactly similar rock occurs in Fernando de Noronha, an island lying off the East coast of Brazil, which I visited in 1887, and with which Christmas Island has many points in common. This coral rock has been described by Mr. BRANNER in some notes on the petrology of Fernando de Noronha, published lately in the American Journal of Science as being derived from sand-dunes hardened by carbonate of lime. He shows, however, by analysis that it consists almost entirely of carbonate of lime with a very small proportion of silica which would at once negative that suggestion. Furthermore, it was quite easy to find at Fernando de Noronha spots where the coral-reef, which was still growing at the outer edge in the sea, passed into the compact ringing rock with no distinguishable organic remains in it. It is true that on Fernando de Noronha there are sand-dunes which might, and indeed had in one place, become hardened more or less into rock, not much resembling, however, the limestone, but in Christmas Island there is no level place on which could develope sand-dunes sufficiently extensive to form the immense mass of rock of which the greater portion of the island consists.

On our return from Christmas Island to Singapore we stopped for an hour or two at Anjer Point in Java, opposite the volcanic island Krakatau, of which so large a portion was destroyed by an eruption a few years ago. Anjer Point was then struck by an enormous wave which overthrew the light-house and caused a great loss of life. On the shore near the remains of the old light-house are some very large blocks of stone which, I was informed, were thrown up there from Krakatau, when in eruption. However, on examining them, I found they were masses of ordinary coral reef, which were probably thrown up from the sea by the large wave. They were quite of the same nature as the Christmas Island rock as far as I could make out, but the organic remains were plainly visible and the rock less compact.

The soil which covers the rock beds in the forest is powdery, and dark brown, strongly impregnated with guano from the droppings of the numerous sea birds nesting upon the trees very similar to that of Fernando de Noronha. The forest is composed of a large variety of trees, many of very large size and producing good timbers, among them was the Gayam (*Inocarpus edulis*), species of *Eugenia* and *Ficus, Sideroxylon sundaicum*, an *Erythrina* with very small but brilliant orange flowers, and several other kinds of which I was unable to procure enough material to identify. The trees are clothed with ferns of several species, orchids and a wax-plant (*Hoya Aldrichii*, Hemsl.) which is called by the colonists the Flower of Paradise, from its beauty. It is very abundant, but I saw no trace of fruit or flowers, and had to content myself with bringing home some living plants. The orchids were abundant, too, the most common being a new species to which I have given the name of *Saccolabium archytas*. It has thick bright green leaves and long racemes of small white flowers spotted with pink. Besides these there was a *Dendrobium* of the *Cadetia* section, *D. crumenatum*, the well-known pigeon-orchid, a curious new species of *Sarcochilus* and what appeared to be one of the *Phreatias* described from LISTER'S collection by Mr. ROLFE. None of these latter were in flower at the time of my visit, but I secured live plants, and the *Sarcochilus* has since flowered in Singapore.

The pigeon-orchid is one of the most widely distributed of tree orchids in the East Indian region, and I was much surprised to pass a large number of plants apparently of this species quite fresh and green floating in the sea between Singapore and Batavia. One does not imagine that so delicate a plant as an orchid could survive prolonged immersion in the sea.

Terrestrial orchids were represented by *Corymbis veratrifolia*, Bl., also a very widely distributed species occurring in Western Africa, Assam, all over the Malay Peninsula and on the Malay Archipelago. It is true that BLUME in his "Orchids of the Indian Archipelago" distinguishes the African, Assamese and Malayan plants as three distinct plants, but the distinguishing characters appear to me too slight, especially as the plant is evidently a very variable one. I recently found specimens in Pulau Ubin near Singapore which were quite indistinguishable from some of the African forms.

Ferns are very abundant. Mr. LISTER collected fifteen species, two of which, viz., an *Asplenium* and an *Acrostichum* were new to science. The ground beneath the bigger trees in the forest produced many shrubs and small plants, among which were *Anisomeles ovata*, a large straggling herb with purple flowers like a large dead nettle ; and another horehound-like Labiate with white flowers, a shrubby species of *Achyranthes*, *Ehretia buxifolia*, *Laportea crenulata*, Gaud., a tree nettle with stinging petioles, clumps of *Pandani*, *Oplismenus compositus*, *Fleurya æstuans*, and other plants. A *Randia*, perhaps of an undescribed species, formed coffee-like bushes with small white flowers and orange berries. It is evidently allied to *R. densiflora* which is also stated to occur here, but entirely different from that species in its smaller size of parts and habit. *Ochrosia Ackeringæ*, Miq., is a small *Apocynaceous* tree with white flowers and twin yellow fruits. In more open places near the shore were a tall Mallow (*Abutilon* sp.), with fairly large buff flowers, one of the common tree vines (*Leea sambucina*, L.) resembling an elder bush, and a scrambling bryony with small flowers (*Zehneria mucronata*, Miq.) and on the sandy spots by the shore were the common Waroo (*Hibiscus tiliaceus*), the goat's foot convolvulus (*Ipomea pes-capræ*), *Scævola Koenigii*, L., and *Ischoemum foliosum Hack var. leiophyllum*. This grass was identified for me by Professor HACKEL, who says, that this is a new variety differing from the type only in the glabrous leaves. This type is only known from New Caledonia.

The native palm (*Arenga Listeri*, Becc.) is plentiful, especially on the lower ground near the sea. It is a beautiful species about twenty feet in height with a stout green stem about four inches through, smooth except for the rings. The leaves are large, pinnate, light green above and glaucous beneath. The fruits resemble coffee-berries and are bright red, each containing three seeds. They are peculiarly irritating even when handled like those of *Caryota urens* and *Kentia Macarthuri*. The tree produces a very excellent sago which is used as food by Mr. ROSS' party. Indeed Christmas Island produces, for an island of its size, a remarkably large supply of natural vegetable and animal food, for besides the sago, there are plenty of Gayam (*Inocarpus edulis*) and Indian almonds (*Terminalia catappa*) both eatable and excellent fruits; while land crabs, pigeons and frigate birds supply plenty of animal food.

The birds of the island are somewhat interesting. A pretty brown ground thrush with a red abdomen was very abundant and tame, hopping about everywhere, and small green warblers (*Zosterops natalis*, Sharpe) flew about in little flocks and were very bold and fearless. A small brown hawk like a kestrel (*Urospizias natalis*, Sharpe) appeared on one occasion and fell to the gun. But the attraction to the party who landed from the *Redpole* lay in the pigeons, of which there were two species, one resembling the common green pigeon, the other a large blue dove, known as *Carphophaga Whartoni*, peculiar to this island. This is a very beautiful bird allied to the common Pergam (*C. œnea*), but of a rich deep blue colour. It is very abundant especially on the top of the hill, and towards sunset the woods resounded with its loud note. It sits high up in the lofty trees and is by no means easy to see. It is a very strong bird, several receiving four complete charges of shot before dropping and, like the common Pergam, is tough and not worth eating, but as an ornamental bird it has been successfully introduced into the Cocos Islands by Mr. ROSS.

Of the marine birds, the Frigate Bird (*Fregata aquila*), tropic birds (*Phaethon flavirostris*) and boobies (*Sula piscatrix*) were very abundant nesting on the trees and filling the air with their fishy odour. The Frigate Bird is, we found, very good eating, having dark brown flesh with a good and not fishy flavour. Towards evening the great fox bats (*Pteropus natalis,* Thom.), began to appear and clung squeaking to the branches of the trees which were in fruit. They are quite different from the common fox bat, being entirely black. I saw also a small insectivorous bat flying about, but could not catch it.

The native rats, *Mus Maclearii* and *M. nativitatis*, Thom., do not appear till dark, and as we left before sunset we could not secure any specimens. There are several kinds of lizards here, two of which I caught; one was a very dark, coloured gecko inhabiting the old stumps and rotten trees lying on the ground. As is constantly the case in islands and especially in oceanic islands there are no snakes here, though Mr. ROSS has seen, he tells me, their skeletons washed up on shore. But the most conspicuous denizens of the forest are the large blue and red land crabs (*Birgus latro*) which are exceedingly abundant living in holes in the ground, but constantly wandering about in the woods. Insects are not numerous. I noticed three species of butterfly, a yellow Terias, (*T. amplexa*) a Hypolimnias and what was probably the endemic species *Vadebra Maclearii*, but I could only get a single specimen of the first named species. Mr. ROSS presented me with a pair of very fine maroon-coloured hawkmoths, and told me that there was another and much finer kind to be met with of which he hoped to secure specimens. Of other insects I saw an abundant species of small red wasp, and a fine large *Buprestid beetle*, of a light but brilliant green colour glittering all over, and a large green larval mantis, too young to identify.

I append a list of all the animals and plants recorded, as far as I know, from the island, and hope that Mr. ROSS, who takes much interest in his insular home, will be enabled to assist us in getting a more complete idea of the fauna and flora of Christmas Island.

LIST OF ANIMALS AND PLANTS RECORDED FROM CHRISTMAS ISLAND.

[NOTE :—In this list all endemic plants and animals are printed in italics. The (!) denotes that specimens were seen or gathered by myself, and the asterisk (*) marks those that have not previously been recorded.]

MAMMALS.

* *Pteropus natalis,* Thomas. !
Small insectivorous bat. !
Crocidura fuliginosa var, trichura, Dobs.
Mus Maclearii, Thomas.
Mus nativitatis, Thomas.

BIRDS.

* *Merula erythropleura*, Sharpe. !
Zosterops natalis, Sharpe. !
Collocalia natalis, Sharpe.
* *Carpophaga Whartoni*, Sharpe. !
Chalcophaps natalis, Sharpe.
* *Urospizias natalis*, Sharpe. !
Minox natalis, Sharpe.
* Ardea jugularis, Forster. !
Charadrius Geoffroyi, Wagler.
Tringoides hypoleucus, L.
Phæthon phœnicurus, G. M.
Phæthon flavirostris, Brandt. !
* Fregata aquila, L.
Sula piscatrix, L. !

REPTILES.

Gymnodactylus marmoratus, Kahl.
Gecko Listeri, Blgr.
Lygosoma nativitatis, Blgr.
Ablepharus egeriæ, Blgr.
Typhlops exocœti, Blgr.
Chelonia virgata.

LEPIDOPTERA.

Vadebra Maclearii, Butl.
Hypolimnias Listeri, Butl.
Nacaduba aluta, Butl.
* *Terias amplexa*, Butl.
Terias patruelis, Moore.
Porthesia irrorata, Butl.
Hydrillodes, sp.
Endragana limbata, Butl.
Sphingida, sp.
Pyralis Listeri, Butl.
Boarmia compactaria, Walk.

COLEOPTERA.

Morio orientalis, Dejean.
Hololepta, sp.
Poederus, sp.
Paroegus Listeri, Gahan.
Leptaulax, sp.
Chrysodema simplex, Waterh.
Stigmatium, sp.
Muephilus, sp.
Hopatrum, sp.
Sessinia, 2 sp.
Ceresium nigrum, Gahan.

HEMIPTERA.

Lygoeus subrufescens, Kirby.

HOMOPTERA.

Oxypleura calipso, Kirby.
Ricania flavicostalis, Kirby.
R. affinis, Kirby.
R. hyalina, Kirby.

DIPTERA.

Laphria nigrocoerulea, Kirby.
Stilbomyia jucunda, Kirby.

MYRIAPODA.

Cryptops hortensis, Leach.
Cryptops inermipes, Pocock.
Mecistocephalus castaneiceps, Haase.
Cylindrodesmus hirsutus, Pocock.
Spirostreptus exocoeti, Pocock.

ORTHOPTERA.

Labidura nigricornis, Kirby.
Blatta livida, Fabr.
Panesthia javanica, Serv.
Clitumnus stilpnoides.
A large larval Mantis.
Phisis Listeri, Kirby.
Gryllacris rufovaria, Kirby.
Primnia orientalis, Kirby.
Cyrtacanthacris fusilinea, Walk.
C. disparilis, Kirby.
Epacromia rufostriata, Kirby.

HYMENOPTERA.

Camponotus melichlorus, Kirby, (Formicidæ).
Lobopelta diminuta, Kirby, (Poneridæ).
Odynerus polyphemus, Kirby, (Eumenidæ).
Polistes belder, Kirby, (Vespidæ).

ARACHNIDA.

Nephila nigritarsis, Koch.
Homalattus auratus, Koch.
Heteropoda venataria, L.

CRUSTACEA.

Hyloeocarcinus natalis, Pocock.
Birgus latro, L.
Monohammus nativitatis, Gahan.
Praonethra perplexa, Gahan.
Micracantha, sp.

CRUSTACEA,—*Continued.*

Epilachum, sp.
Piezonotus discoidalis, Waterh.

MOLLUSCA.

Ariophanta Normani, Smith.
A. Mabelæ, Smith.
A. Mildredæ, Smith.
Succinea solidula, Pfeiffer.
S. solitaria, Smith.
S. Listeri, Smith.
Pythia scaraboeus, L.
Melampus luteus, Quoy.
Melampus fasciatus, Deshayes.
Truncatella valida, Pfeiffer.
Leptopoma mouhoti, Pfeiffer.

PLANTS.

DICOTYLEDONES.

Abutilon indicum var. ?
* A. sp. !
* Hibiscus abelmoschus, L. ! Near the Settlement.
* H. tiliaceus. ! Common on the shores.
Vitis pedata. !
Leea horrida, Teysm.
* L. sambucina, L. ! Near the shore.
Erythrina, sp. ! Tall tree. Flowers small, scarlet orange.
Inocarpus edulis, Forst.
Terminalia catappa, L.
Eugenia, sp.
Barringtonia racemosa, Bl.
Pemphis acidula, Forst.
Zehneria mucronata, Miq. Near the shores.
Heptapleurum ellipticum, Seem. !
Randia densiflora, Benth.
* R. sp. ! Bushes common near the Settlement.
* Psychotria, sp. ! On the top of the ridge, small dark green bushes.
Blumea spectabilis, Dec.

PLANTS,—*Continued.*

* Spilanthes acmella, L. ! Near the huts.
Scœvola Koenigii. !
Ardisia complanata, Wall.
Sideroxylon sundaicum, Miq. ! A lofty tree near shore.
Ochrosia Ackeringæ, Miq. ! Small tree near shore.
Hoya Aldrichii, Hemsl ! Covering all the trees luxuriantly.
Cordia subcordata, Lam.
Ehretia buxifolia, Roxb.
Tournefortia argentea, Linn.
* Ipomea pescaprae. ! Linn. Sea shore.
Solanum biflorum. ! Lour. !
Datura alba.
Dicliptera Maclearii, Hems.
Anisomeles ovata, R. B. L. In the woods, common.
Callicarpa longifolia, Lam.
Tectona grandis, Linn.
Boerhaavia repanda, Willd.
Pisonia excelsa, Bl.
Achyranthes aspera, L.
* A. sp. ! A shrubby species near the shore in the woods.
Deeringia celosioides, R. Br.
Peperomia, sp.
Hernandia ovigera, L.
Euphorbia hypericifolia, L.
Cleidion javanicum, Bl.
Macaranga tanarius, Muell. Arg.
Cudrania javanica, Trec.
Laportea crenulata, Gaud. !
Fleurya ruderalis, Gaud. !

MONOCOTYLEDONES.

* Dendrobium crumenatum, Lind. !
* D. (§ cadetia) sp.
Phreatia Listeri, Rolfe.
Ph. congesta, Rolfe.
* *Sarcochilus carinatifolius sp.* One plant only found.
* *Saccolabium Archytas sp.* ! Very abundant.

MONOCOTYLEDONES,—*Continued.*

* Corymbis veratrifolia, Bl. ! Top of the ridge.
Arenga Listeri, Becc. !
Pandanus, sp. Bushes near shore.
Fimbristylis cymosa, R. Br.
* Digitaria sanguinalis, L. Near the Settlements.
* Oplismenus compositus, Beauv. ! In the woods.
Ischæmum muticum, L.
* I. foliosum var. *leiophyllum,* Hack. ! On the shore, forming big tufts.
* Eleusine indica, L. ! Near the Settlement.
Eragrostis plumosa, Lk.

FERNS.

Davallia solida, Sw.
D. dissecta, J. Sm.
Asplenium Nidus, L. !
A. falcatum, Lam. !
A. centrifugale, Bak.
Nephrodium truncatum, Presl.
N. syrmaticum, Bak.
Aspidium membranaceum, Hook.
Nephrolepis acuta, Presl.
N. ramosa, Moore.
Polypodium adnascens, Sw.
P. irioides, Lam.
Vittaria elongata, Sw. !
Acrostichum flagelliferum, Wall.
A. Listeri, Bak.

LYCOPODIACEÆ.

Lycopodium phlegmaria, L.

MOSSES.

Neckera Lepineana, Mont.
Thyridium fasciculatum, Nutt.

HENATICÆ.

Ptychanthus squarrosus, Mont.
Lejeunia serpyllifolia, Lib.

LICHENS.

Usnea trichodea, Ach.

FUNGI.

Polyporus australis, Fr.
P. conchatus, Fr.
Stereum lobatum, Kze.

NEW SPECIES DESCRIBED.

Sarcochilus carinatifolius.

Stem six inches long, flattened. Leaves fleshy oblong-elliptic slightly unequally bilobed blunt at the lip, bright green very strongly keeled especially at the base, two inches long one inch across; the base flattened laterally so as to form a broad flat petiole; sheath very deeply cleft on side opposite to lamina, when dry strongly ribbed. Scapes very graceful erect slender pale green about six inches long with one or two small sheathing bracts. Raceme of few flowers, opening one or two at a time, rachis thickened terete; bracts lanceate acute; green $\frac{1}{8}$ of an inch in length; flowers small thin textured, white withering buff; ovary and pedicel $\frac{1}{2}$ inch long, straight bright green. Posticous sepal lanceolate acuminate with recurved apex, laterals similar but the base prolonged below into an angle, keeled outside. Petals shorter linear lanceolate. Lip white base prolonged to form a blunt spur, lateral lobes very long narrow linear acuminate, midlobe shorter thick ovate blunt; a lorate raised ridge on the disc ending in a blunt rounded callus on the midlobe; a yellow spot on the base of the lip outside. Column straight thick with a distinct foot, clinandrium nearly flat, wings of column bent over the face, foot linear upcurved. Another quadrate rounded at the top front edge truncate straight. Pollinia four unequal oval flattened with a small oval disc. Stigma deep oval ; rostellum small.

A curious little plant, which bears no very distinct relation to any other species I know, but is probably an ally of *S. leopardinus*, Par., or at all events belongs to the section which includes this plant.

Saccolabium Archytas. nsp.

Stems short usually crowded in large masses with very many roots. Leaves lorate few, bright green, apices unequally bilobed, with blunt lobes, six inches long, by one broad. Racemes pendulous covered with small flowers, four to six inches long with a rather slender angled green rachis. Bracts short ovate acute. Flowers hardly ½ inch across, opening a few at a time, ovary and pedicel ½ inch long white, terete. Dorsal sepal narrow oblong obtuse boat-shaped, laterals obcuneate subtriangular. Petals spathulate with a broad obtuse apex, shorter than the sepals. All white. Lip small with sidelobes large and rounded white with violet spots, midlobe absent. Spur large straight dependent blunt. Column base narrow, above dilated, white with a violet face. Anther ovate acute in front, yellow. Pollen masses two globose pale yellow, pedicel linear rather broad, disc ovate. Capsule slender elongate three inches long, ribs not much elevated.

This is a pretty little plant although the flowere are so small. It is remarkable for the subtriangular sepals and the lip being reduced almost to a spur with the lateral lobes flanking the mouth.

SUMMARY.

The fauna and flora is typically Malayan as might be expected from the position of the island, and is evidently primarily derived from the coasts of Java which is the nearest land. Perhaps when the southern regions of Java are better worked out we shall find some of the peculiar Christmas Island species occurring there.

The greater part of the plants fall under one of the two heads, those whose seeds or fruits are carried about unharmed by sea currents, and those which having edible fruits are dispersed by birds. These in fact are the two methods by which most of the oceanic islands are populated. To the first class belong *Hibiscus tiliaceus, Inocarpus edulis, Terminalia Catappa, Barringtonia racemosa, Pemphis acidula, Ochrosia, Ackeringæ, Cordia subcordata, Tournefortia argentea, Ipomea pes capræ, Boerhaavia repanda, Hernandia ovigera, Pandanus*, sp., *Fimbristylis cymosa*, and probably also *Erythrina, Abutilon, Ehretia buxifolia* and *Tectona*. *Dendrobium crumenatum* and the other orchids may have been derived from plants drifted ashore on fallen trees.

As fruit-eating birds and bats are very numerous it is not to be wondered at that there are many species with edible fruits, which have been brought to the island by them. To this class belong *Vitis, Leea, Zehneria, Heptapleurum, Randia, Psychotria, Ardisia, Solanum, Callicarpa, Deeringia, Ficus, Didymosperma* and probably also *Eugenia, Sideroxylon, Euphorbia*, and *Cleidion*. The fruits of *Didymosperma* are as stated above very irritating but this is no bar to their being devoured by birds. The fruits of *Kentia Macarthuri*, a New Guinea palm, are nearly as irritating, but they are greedily eaten by the blue starlings in the Botanic Gardens, at Singapore and I found, in Fernando de Noronha, a species of Sapium which was so poisonous that the fruit falling on a horse would blister the skin, yet it was often eaten by small birds.

A few species have been introduced accidentally by man into Christmas Island, and this class will doubtless increase largely. Nearly all of these occur close to the Settlements. They include *Hibiscus Abelmoschus, Spilanthes, Datura, Achyranthes aspera, Eleusine, Digitaria* and perhaps *Abutilon indicum*. Such plants as *Pisonia excelsa* with its sticky fruits, *Achyranthes* sp. and *Oplismenus* may have been borne to the island by birds, as their fruits are more or less adhesive.

It might be imagined that winged or plumed seeds would be easily carried to distant islands and consequently form an important element in the flora. This is not so. In the majority of cases these seeds are carried a short way only and even if they were widely scattered by prolonged and violent winds, they would have but little chance of accidentally striking an island far off in the sea. To the class with plumed seeds belong *Hoya Aldrichii*, and *Blumea spectabilis.* Both may have been introduced by wind-currents.

Orchids are acknowledged to be rare in Oceanic Islands although their minute seeds are blown from the split capsules for a considerable distance. Perhaps that the Christmas Island species were in this manner drifted to their present home, but it is also possible that the epiphytic species were floated there on logs of fallen trees.

Ferns, the spores of which are produced in enormous quantities and are exceedingly light, are certainly widely scattered by the blowing of their spores to long distances, and the same remark applies to Fungi, Mosses and other Cellular Cryptogams.

* * *

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OCCASIONAL NOTES.

DISCOVERY OF A STONE IMPLEMENT IN SINGAPORE.

A short time ago, Lieutenant A. D. Cox, while walking on a road at the barracks at Tanglin, picked up from among the laterite which was being put on the road a large stone implement, which he has presented to the Museum. The weapon is five inches in length and nearly four inches across and about one and a half thick in the thickest part. It is oblong, with one end abruptly truncate, the other ground off to a rounded cutting edge. It is a good deal worn, and at one spot bears a small coral, showing that it had recently come from the sea. It is of a dark chocolate-brown externally, but by dipping it a little at one corner it was found to be composed of a very hard compact granite containing very small flakes of mica. On enquiry I found that the contractor who was laying down the laterite had obtained it from Tanjong Karang on the West Coast of Singapore. This spot I have since visited, and found that the stone was being taken from below high water mark, which would account for the presence of the coral upon the specimen. Tanjong Karang is a small promontory, consisting of a core of rather hard iron-stone, covered with about two feet of humus and gravelly soil. There is what is called a *Kramat* at the corner nearest to the spot whence the specimen must have come, but this *Kramat* merely consists of a detached block of iron-stone, which in shape more or less resembles a tomb. The overlying soil on the promontory has so shifted from denudation that it is impossible to get any idea of its age; fragments of modern pottery occurring even at the part where it rests on the iron-stone. I sought carefully for any more weapons, but could find none, and indeed it was hardly to be expected, as they are almost always found singly here.

Hitherto, as far as I am aware, no worked stone of this class has ever been found in Singapore, though stone implements have been obtained in some numbers in Perak and Pahang, where they are known as *Batu Linta*. These latter are generally made of a black igneous rock, and of a narrower form than the present one. The form, however, of a stone axe must always depend on the texture and hardness of the stone and its cleavage. And the exceedingly hard texture of this granite is, no doubt, the reason for its broad shape. The edge has evidently been ground very carefully, but not equally, one side being flatter than the other. From this I gather that the weapon was used as an adze or *biliong*.

Of what race were the makers of these weapons we are entirely ignorant, none of the wild tribes use stone weapons, nor do they know anything about those that are found in the Peninsula. Nor is the stone of which the Pahang specimens are made, known at all from this region. It is probable that these were brought from farther East, but the Singapore specimen is made of granite, and of such granite as is found at no great distance from Tanjong Karang, namely, at Pulau Ubin, and I also found an outcrop of granite in one of the hills between Tanjong Karang and Toas. It is probable, therefore, that it was made on or near the spot where it was found, possibly from a sea-shore pebble of granite from the neighbourhood of Pulau Ubin.

H. N. R.

PANTANG LARANG OF NEGRI SEMBILAN.

The Yam Tuan Besar of Negri Sembilan has recently caused to be published certain rules for the conduct of the Malays of that State. These rules—*Pantang Larang*—are not new, but are some of the old rules of the State. They are now published to show the masses that the Malay customs are in full force as hitherto. The following is a translation :—

It is forbidden—

1. To fire guns or cannons during the three days previous to either of the great feasts called *Hari Raia* or *Hari Raia Haji*, *i. e.*, on the 28th, 29th or 30th of Jal Haija.

2. To disobey a lawful order of the Raja or Penghulu.

3. For any one to wear clothes of the colours which are set apart as the special colour attached to the Rajaship, or to any State office, such as yellow, which is the Raja's colour: or to carry the hair-ornamented spear, or to wear entirely black clothing, which may only be the dress of officers such as the *Laksamana*.

4. For any person to make use of and display weapons or articles similar to the insignia of a Chief or State officer, as such insignia.

5. To recite the form of prayer called *Hothbah*, except at the Istana, Penghulu's or Lembaga's Court-house, Mosque, or at any other place specially set apart by the Raja or Penghulu.

6. For any person to wear weapons having gold or silver ornaments covering either the end of the handle or of the sheath, except by permission or rank.

7. To arrange his house or premises similarly to a royal hall, called *Balei jariga*, which is fenced round with split *runyong* (the Kabong tree) according to the ancient custom in the country of Menangkabau, with gates roofed (*i.e.*, with an arch over them), with the exception of persons who are permitted by the Raja or Penghulu.

8. The big drum of the Mosque is not to be beaten, except on feast days or on the occasion of any public calamity, or at a calling together of the people.

Dahga Dahgi. This means that the people of low rakn must never disobey the orders of those of higher rank than themselves.

Sumbang Salah. This means that the children of two women who are sisters cannot marry each other. It is against the law of the country.

Chelaka Derahka means that whosoever disobeys these orders shall be considered guilty of treason.

Whoever disobeys the aforesaid rules is liable to a fine not exceeding twenty-five dollars.

M. L.

ON THE OCCURRENCE OF A RHODODENDRON IN SINGAPORE.

In January of this year, while walking near the bungalow on the top of Bukit Timah with Lieutenant KELSALL, I observed in the upper branches of a lofty Dipterocarpous tree, probably a species of *Shorea*, an epiphytic plant with red flowers. On going to the foot of the tree we picked up several fallen blossoms, from which it was evident that the plant was a species of *Rhododendron*, and that, one not known to occur in the Malay Peninsula. The tree was about 150 feet high, and about 6 feet through, without a branch for fully 80 feet, so that it was by no means easy to reach it. The following plan was then adopted. A number of large spike nails were driven into the tree, and a pole lashed to them so as to form a ladder, for about a quarter of a distance. A Malay then ascended this with a further supply of nails, and a pulley block being fixed to the tree another pole was hauled up and made fast to the lower one. This was done again and again till the lowest branch was reached, and eventually the plant was lowered to the ground. There were two plants on the tree, which were transferred to the Botanic Gardens, where one remained a long time in flower. The plant is an exceedingly beautiful one, with clusters of nodding flowers about two inches long, of a beautiful crimson-red colour. It appears to be identical with one figured in the Botanical Magazine under the name of *Rhododendron javanicum* var. *tubiflorum* (Tab. 9850), difering only in the colour, which in the picture is a very dull red. The plant from which this drawing was made was obtained by Mr. CURTIS in Solok in Sumatra, and sent home to Mr. VEITCH, who cultivated it in England. It seems, to me however, that this so-called variety is specifically quite distinct from *Rhododendron javanicum*, which is also a native of the Peninsula.

Rhododendron javanicum, Benn., is based on a plant found in Java by Dr. HORSFIELD, and is figured and described in BENNETT & HORSFIELD'S *Plantæ Javanicæ Rariores* (Tab. xix), and I have what is evidently the same plant from Gunong Hijau in Perak, collected by Mr. CURTIS, but the tube of the flowers is rather shorter and more infundibuliform. The Singapore plant differs from the true *javanicum* in the leaves, which are shorter, thicker and blunter and more conspicuously dotted with glands, and the base of the blade is not narrowed into the petiole, but ends abruptly. The flowers are nodding on rather long pedicels. The tube is very long in proportion to the limb, nearly 1½ inch, the lobes of the limb are short, broad and rounded, about half an inch long. The tube is cylindric, slightly curved, and when alive grooved at the base, where, as in the Perak plant, it is almost funnel shaped, with very large lobes to the limb. The stamens again are much thinner, the anther only half the size. The style is thick and the stigma large and somewhat trilobed in the Perak plant and in BENNETT'S figure, whereas in our plant the style is thin, with a much smaller more simple stigma. These points are so marked, that it appears to me that the two plants should be specifically separated. It is very possible that the Singapore plant may be identical with *Rh. longiflorum*, Lindl, a plant which has been found in Borneo at sea level by Professor BECCARI, whose description fits it fairly well, but I have not here LINDLEY'S original description of that plant.

Besides this species, there are four other kinds of *Rhododendron* in the Malay Peninsula.

Rh. malayanum, Jack, which is the commonest, occurs on Mount Ophir, Gunong Hijau, and Maxwell's Hill, and in other mountains of the central range, and also in Sumatra, Java and Celebes. It is a straggling plant with small crimson flowers.

Rh. jasminiflorum, Hook., with clusters of white jessamine-like flowers, only known from Mount Ophir.

Rh. Teysmanni, Miq., a yellow flowered plant, grows on Penang Hill. It is an ally of *Rh. javanicum*, Benn., which is the fourth species.

All these grow on the trees as epiphytes, usually at considerable altitudes, *i. e.*, from 2,000 feet upwards.

The only other plant of the order *Ericaceæ* yet recorded from the Peninsula is a *Diplycosia microphylla*, Becc., a remarkable little creeping plant, which appears to be common at high altitudes. It has more of the appearance of one of the bilberry family, with tough, wiry branches, and small oval leaves.

The allied orders of *Vacciniaceæ* and *Epacrideæ* are represented respectively, in Singapore, by *Vaccinium malaccense* a bush of considerable size, with pink or white sweet-scented heather bell-shaped flowers, and small eatable black bilberries; and the remarkable *Leucopogon malayanus*, Jack, a large bush with hard, sharp-pointed leaves, very small white flowers, and sweet but very small orange berries. Both grow on sandy ground near Changi towards Tanah Merah, *Leucopogon* forming here dense thickets. Another species of *Vaccinium* also grows in Pekan, with longer and more crimson flowers.

H. N. R.

POGONIA PUNCTATA, BL., IN SINGAPORE.

The genus of orchids *Pogonia* has not hitherto been recorded from the Malay Peninsula, but as the surrounding countries produce a number of species, it is not to be wondered at that at least one kind should occur here. Some months ago, I found in a stream on the western slope of Bukit Timah a small plant of some species of this genus, and by carefully transferring the small tuber with its solitary leaf to the Botanic Gardens, I was able to induce it at last to flower, when it proved to be *P. punctata*, Bl.—a plant obtained by BLUME from the slopes of Mount Pangerang in Java, and figured by him in the "Orchids of the Malay Archipelago" (Tab. 42).

This plant belongs to the section of the genus in which the umbrella-shaped leaf appears alone, and, after remaining for a short time, suddenly withers and is followed by a stem bearing one or more flowers. In this species the leaf is about three inches tall, the blade being orbicular, cordate dark green and more or less purple beneath. The flower stem is about the same height, covered with sheaths, which are thickly dotted with purple, whence the trivial name. It bears a single nodding flower about an inch and a half long, with a purple ovary and a pale glower thickly spotted all over outside with purple. The petals and sepals are very narrow linear acute. The lip is white with violet spots. The flower has a faint scent of cucumbers. It never seems fully to open. Probably it is not so rare as it would appear, for, without doubt, it is an exceedingly difficult plant to find, as it is very inconspicuous and occurs apparently quite sporadically. I have several times since hunted in the spot where I found this little plant, and never seen any more.

H. N. R.

THE KERINGGA.

Since writing the account of the Caringa (more correctly Keringga) in the last number of the Journal, I have received a letter from Mr. WATERHOUSE, of the British Museum, in which he tells me that the specimens I sent him are *Œcophylla smaragdina* and not *Formica gracilipes.* It apparently takes its name of *smaragdina* (emerald green) from the curious dusk-green colour of the winged female. It is identical with the insect of Ceylon and Southern India.

H. N. R.

EUDROMIAS VEREDUS IN SINGAPORE.

ON the 13th of May, 1891, the Museum Taxidermist, Mr. L. A. FERNANDEZ, saw a Malay boy capturing birds by means of hair nooses on the race course. On inspecting his captures, he found a pair of plovers ♂ and ♀ with which he was not acquainted ; these he purchased for the very moderate sum of 10 cents for the pair, and they are now mounted. They prove to be *Eudromias veredus* of Gould., originally described P. Z. S., 1848, p. 38. The species is rare in this part of the world. It has been recorded once from the Andamans (S. F. I., 83) and once from the Sunderbunds. It however seems to occur not unfrequently in Java and the islands farther East.

W. D.

I may also note that when at Penang in May last I noticed a flight of about 20 birds of the rare tern *Sterna leucoptera*.

W. D.

FRUGIVOROUS HABITS OF THE TUPAIA.

This little insectivore (*Tupaia javanensis*) is very common in Singapore, and especially in the Botanic Gardens, where it may be often seen running about among the trees. It is easily mistaken for the common little squirrel (*Sciurus hippurus*), of which it has much the appearance. When alarmed it quickly darts up the trunk of the nearest tree, but is a poor climber, and never seems to go high up like the squirrel. But besides these points of resemblance, it appears also to be largely frugivorous. It was found that the seeds sown in boxes were constantly being dug up and devoured by some animal, and traps baited with pieces of coco-nut or banana were set, and a number of tupaias were caught. These being put into a cage appear to live very comfortably upon bananas, pineapple, rice and other such things ; refusing meat. The Rev. T. G. WOOD, in his Natural History, states that *T. ferruginea* is said to feed on beetles, but to vary its diet with certain fruits. The common species here seems to be almost entirely frugivorous, though its teeth are those of a typical insectivore.

H. N. R.

Gars

506.545

[No. 24.]

JOURNAL

OF THE

STRAITS BRANCH

OF THE

ROYAL ASIATIC SOCIETY.

DECEMBER, 1891.

SINGAPORE:

Printed at the Government Printing Office.

Agents of the Society:

London and America, ... Trübner & Co.
Paris, ... Ernest Leroux & Cie.
Germany, ... K. F. Koehler's Antiquarium, Leipzig.

193852

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THE

STRAITS BRANCH
OF THE
ROYAL ASIATIC SOCIETY.

PATRON:

His Excellency Sir CECIL CLEMENTI SMITH, G.C.M.G.

COUNCIL FOR 1892.

His Excellency Major-General Sir Charles Warren, G.C.M.G., K.C.B., *President.*

The Right Revd. Bishop G. F. Hose, *Vice-President, Singapore.*

D. Logan, Esquire, *Vice-President, Penang.*

H. N. Ridley, Esquire, *Honorary Secretary.*

H. T. Haughton Esquire, *Honorary Treasurer.*

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H. L. Noronha, Esquire,
C. W. S. Kynnersley, Esquire. *Councillors.*
Lieut. H. J. Kelsall, R.A.,
The Hon'ble J. W. Bonser,

LIST OF MEMBERS

FOR

1892.

Nos.	Names.	Addresses.
1	Abrahamson, E. E.	China North Borneo Co. Ltd., Sandakan, B. N. B.
2	Allingham, S.	25, Grosvenor Street, Grosvenor Square, London, W.
3	Anthonisz, J. O.	Singapore (Europe).
4	Ayre, A. F.	Singapore (Europe).
5	Bampfylde, C. A.	Kuching, Sarawak.
6	Becher, H. M.	Singapore.
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8	Bellamy, G. C., B.A.	Selangor.
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10	Bicknell, W. A.	Audit Department, Penang.
11	Birch, J. K.	First Magistrate, Penang.
12	Bland, R. N.	Land Department, Singapore.
13	Blagden, C. O.	Malacca.
14	Bonser, The Hon'ble J. W.	Singapore.
15	Bott, Dr. W.	The Grange, Grange Road, Singapore.
16	Braddon, Dr. W. L.	Jelebu.
17	Brandt, D.	Singapore.

MEMBERS FOR 1892,—*Continued.*

Nos.	Names.	Addresses.
18	Brown, L. C.	Penang.
19	Brown, Dr. W. C.	Beach Street, Penang.
20	Bryant, A. T.	The Dindings.
21	Buckley, C. B.	Orchard Road, Singapore.
22	Burbidge, W.	Sophia Road, Singapore.
23	Burkinshaw, J.	Mount Elizabeth, Orchard Road, Singapore (England).
24	Cameron, Capt. M. A., R.E.	Dover, England.
25	Camus, M. de	Singapore.
26	Cerruti, G. B.	....
27	Claine, J.	21, Northam Road, Penang.
28	Clifford, H.	Kwala Lipis, Ulu Pahang.
29	Copley, George	Municipality, Malacca.
30	Creagh, His Excellency C. Vandeleur, C.M.G.	British North Borneo.
31	Croix, J. Errington de la	France.
32	Currie, Andrew	28, Fenchurch Street, London.
33	Dane Dr. R.	Singapore.
34	Dent, Sir Alfred, K.C.M.G.	11, Old Broad Street, London, E. C.
35	Dew, A. T.	Matang, Perak.
36	Diethelm, W. H.	Hooglandt & Co., Singapore.
37	Down, St. V. B.	Singapore (England).
38	Dunlop, C.	Powell & Co., Singapore.
39	Ebhardt, Hans	Hilty & Co., Singapore.
40	Egerton, Walter	Butterworth, Province Wellesley.
41	Elcum, J. B.	Penang (Europe).

MEMBERS FOR 1892,—*Continued.*

Nos.	Names.	Addresses.
42	Eschke, H. H.	German Consulate, Singapore.
43	Everett, H. H.	Labuan.
44	Everett, A. Hart	Labuan.
45	Ferguson, A. M., Jr.	18 & 19, Baillie Street, Fort, Colombo.
46	Gaggino, G.	Gaggino & Co., Singapore.
47	Gaynor, Lieut. H. F., R.E.	Tanglin Barracks, Singapore.
48	Gentle, Alex.	Grange Road, Singapore.
49	Goldney, Mr. Justice J. T.	Penang.
50	Gosling, T. L.	River Valley Road, Singapore.
51	Gottlieb, G. S. H.	Penang.
52	Graham, James	London.
53	Gulland, W. G.	Paterson, Simons & Co., London.
54	Hale, A.	Negri Sembilan.
55	Haughton, H. T., B.A.	Singapore.
56	Haviland, Dr.	Kuching, Sarawak.
57	Hervey, The Hon'ble D. F. A., C.M.G.	Resident Councillor, Malacca.
58	Hill, E. C. H.	Inspector of Schools, Singapore.
59	Hill, Fenton Walter	Kwala Lumpur, Selangor.
60	Hose, Right Revd. Bishop G. F., M.A., D.D. (Honorary Member)	Sarawak.
61	Hose, C.	Baram, Sarawak.
62	Houthuysen, C. L.	Netherlands Trading Society, Singapore.
63	Hoynck, P. C. van Papendrecht	Singapore.

MEMBERS FOR 1892,—*Continued.*

Nos.	Names.	Addresses.
64	Hullett, R. W., M.A., F.L.S.,	Singapore.
65	Hutchinson, E. R.	....
66	Ibrahim bin Abdullah, Dato Dalam	Johor Baharu.
67	Irving, C. J., C.M.G.	Hillands Tiverton, Devonshire, England.
68	Joaquim, J. P.	Buitenzorg, Paterson Road, Singapore.
69	Johor, H. H. the Sultan of the State and Territory of, G.C.M.G., G.C.S.I. (Honorary Member)	Johor.
70	Kehding, F.	Labuan, Deli.
71	Keith, Dr. A.	Bangkok, Siam.
72	Kelsall, Lieut. H. J., R.A.	Fort Canning, Singapore.
73	Kennedy, Archibald	Batu Gajah, Kinta, Perak.
74	Ker, T. Rawson	Johor Baharu, Johor.
75	Knight, Arthur	Grassdale, River Valley Road, Singapore.
76	Krom Mun Dewawongse Varoprakar, H. R. H. Prince	Bangkok.
77	Kynnersley, C. W. S.	Singapore.
78	Laugher, H.	Singapore.
79	Lawes, Revd. W. G. (Honorary Member).	Port Moresby, New Guinea.
80	Lavino, G.	Dutch Consulate, Singapore.
81	Leask, Dr. J. T.	Malacca.
82	Lees, F. Balfour	Singapore Insurance Company Limited, Singapore.

MEMBERS FOR 1892,—*Continued.*

Nos.	Names.	Addresses.
83	LEWIS, JOHN E. A., B.A.	Government Printing Office, Sarawak.
84	LISTER, The Hon. MARTIN	Negri Sembilan.
85	LITTLE, R. M.	Gaya, Sandakan.
86	LOGAN, D.	Solicitor-General, Penang.
87	LOW, Sir HUGH, G.C.M.G.	London.
88	MACBEAN, W.	Straits Insurance Office, Hongkong.
89	MCKILLOP, J.	Pulau Brani, Singapore.
90	MACHADO, A. D.	Temoh Gold Mines, Kelantan.
91	MARTIN, Dr. L.	Mabar Estate, Deli.
92	MAXWELL, The Hon'ble W. E., C.M.G.	Colonial Secretary's House.
93	MAXWELL, R. W.	Inspector-General's Office, Singapore.
94	MEREWETHER, E. M.	Singapore.
95	MILLER, JAMES	Gilfillan, Wood & Co., Singapore.
96	NANSON, WM., B.A., F.S.A.	Craigton, Tanglin, Singapore.
97	NAPIER, W. J., M.A.	Paterson Road, Singapore.
98	NEAVE, D. C.	Cluny Road, Tanglin, Singapore.
99	NEWTON, HOWARD	Grasslands, St. Thomas Walk, Singapore.
100	NORONHA, H. L.	Devonshire Road, Singapore.
101	O'BRIEN, The Hon'ble H. A.	Singapore.
102	O'SULLIVAN, A. W. S., B.A.	Penang.
103	OWEN, J. F.	Kwala Pahang.

MEMBERS FOR 1892,—*Continued*.

Nos.	Names.	Addresses.
104	PATERSON, D. W.	Guthrie & Co., Singapore.
105	PAUL, W. F. B.	Sungei Ujong.
106	PERAK, GOVERNMENT MUSEUM.	Larut.
107	PERHAM, The Ven. Archdeacon J. (Honorary Member)	Singapore.
108	PICKERING, W. A., C.M.G.	England.
109	READ, W. H. M., C.M.G.	9, Petersham Terrace, Queen's Gate, London.
110	REITH, Revd. G. M., M.A.	Mount Elizabeth, Singapore.
111	RICKETT, C. B.	Hongkong and Shanghai Bank, Foochow.
112	RIDLEY, H. N., M.A., F.L.S.	Botanic Gardens, Singapore.
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114	ROST, Dr. REINHOLD (Honorary Member).	India Office Library, London, S. W.
115	SARAWAK, H. H. The Raja of, K.C.M.G. (Honorary Member)	Kuching, Sarawak.
116	SATOW, E. M., C.M.G. (Honorary Member)	Monte Video, S. America.
117	SCHAALJE, M.	Medan, Deli.
118	SCOTT, Dr. DUNCAN	Batu Gajah, Kinta, Perak.
119	SEAH LIANG SEAH.	Chop "Hin Hin," Singapore.
120	SEAH SONG SEAH	Chop "Chin Hin," Singapore.
121	SHELFORD, The Hon'ble T., C.M.G.	Broadfields, Paterson Road, Singapore.
122	SKINNER, The Hon'ble A. M., C.M.G.	Resident Councillor, Penang.

MEMBERS FOR 1892,—*Continued.*

Nos.	Names.	Addresses.
123	SMITH, H. E. Sir CECIL CLEMENTI, M.A., G.C.M.G.	Government House.
124	SOHST, T.	Mount Rosie, Chancery Lane, Singapore.
125	SOURINDRO MOHUN TAGORE, Raja, Mus. Doc.	Pathuria Ghatha Raj Bati, Calcutta, India.
126	ST. CLAIR, W. G.	Singapore Free Press Office, Singapore.
127	STRINGER, C.	Singapore (Europe).
128	SWETTENHAM, F. A., C.M.G.	Resident, Perak (Europe).
129	SYED MOHAMED BIN AHMED AL SAGOFF	Singapore.
130	SYED ABUBAKER BIN OMAR AL JUNIED	Arabia.
131	SYERS, H. C.	Kwala Lumpur, Selangor.
132	TALBOT, A. P.	Singapore (Europe).
133	THOMPSON, A. B.	Deli, Sumatra.
134	THOROLD, F. THOROLD	Perak (Europe).
135	TREACHER, W. H., C.M.G.	Secretary to Government, Perak.
136	TRÜBNER & Co.	Ludgate Hill, London, E.C.
137	VAN BENINGEN VAN HELSDINGEN, Dr. R.	Deli, Sumatra.
138	VERMONT, The Hon'ble J. M. B.	Batu Kawan Estate, Province Wellesley.
139	WALKER, Lieut.-Col. R. S F., C.M.G.	Perak.

MEMBERS FOR 1892,—*Continued.*

Nos.	Names.	Addresses.
140	Walker, H.	Land and Survey Department, Sandakan, B. N. B.
141	Warren, H. E. Major-General Sir Charles, G.C.M.G., K.C.B.,	Singapore.
142	Watson, E. A.	Bentong, Pahang.
143	West, F. G.	Selangor.
144	Wheatley, J. J. L.	Muar.
145	Wildman, R.	Singapore.
146	Wise, E. A.	Pahang.
147	Wray, L., Jr.	Perak Museum, Perak.
148	Wrench, W. T.	Raffles Institution, Singapore.
149	Yule, Colonel Henry, R.E., C.B. (Honorary Member)	Penywern Road, London, S. W.

Members are requested to inform the Secretary of any change of address or decease of members in order that the list may be as complete as possible.

All communications concerning the publications of the Society should be addressed to the Secretary ; all subscriptions to the Treasurer.

Members may have on application forms authorising their Bankers or Agents to pay their subscription to the Society regularly each year.

PROCEEDINGS
OF THE
ANNUAL GENERAL MEETING
OF THE
STRAITS BRANCH
OF THE
ROYAL ASIATIC SOCIETY,
HELD AT THE
RAFFLES MUSEUM
ON
THURSDAY, 28TH JANUARY, 1892.

PRESENT:

The Right Rev. Bishop G. F. HOSE, D.D., *Vice-President,* H. T. HAUGHTON, Esq., *Honorary Treasurer,* the Hon'ble J. W. BONSER, C. W. SNEYD KYNNERSLEY, Esq., A. KNIGHT, Esq., H. L. NORONHA, Esq., Lieut. KELSALL, R.A., *Councillors;* E. M. MEREWETHER, Esq., Capt. SMITH, C. B. BUCKLEY, Esq., Mr. Justice J. T. GOLDNEY, and H. N. RIDLEY, Esq., *Honorary Secretary.*

The minutes of the last general meeting were read and confirmed.

The Vice-President opened the proceedings with a short address, in which he referred to the decease of Sir J. FREDERICK DICKSON, K.C.M.G., and to the resolution agreed to by the Council expressing their regret at his death.

The resolution was then read by the Secretary, and Mr. Justice GOLDNEY proposed and Mr. KYNNERSLEY seconded, that it should be adopted as an expression of the sentiments of the whole Society. This was agreed to unanimously.

The Secretary and Treasurer then read their respective Reports, and Mr. Justice GOLDNEY proposed and Mr. MEREWETHER seconded their adoption. The Reports were adopted.

The Hon'ble J. W. BONSER proposed that the new Council should revise the Rules and have them correctly printed. This was seconded by Mr. H. T. HAUGHTON and carried.

The following Officers were then elected for the ensuing year:—

President,—His Excellency Major-General Sir CHARLES WARREN, G.C.M.G., K.C.B.

Vice-President,—Singapore: The Right Rev. Bishop G. F. HOSE, D.D.; Penang: D. LOGAN, Esq.

Honorary Secretary,—H. N. RIDLEY, Esq.

Honorary Treasurer,—H. T. HAUGHTON, Esq.

Councillors,—A. KNIGHT, Esq., H. L. NORONHA, Esq., C. W. SNEYD KYNNERSLEY, Esq., Lieut. H. KELSALL, R.A., and the Hon'ble J. W. BONSER.

The Hon'ble J. W. BONSER moved a vote of thanks to the Chairman which was carried unanimously.

* * *

ANNUAL REPORT
OF THE
COUNCIL
OF THE
STRAITS BRANCH
OF THE
ROYAL ASIATIC SOCIETY,
FOR THE YEAR 1891.

THE Council desires to record its sense of the loss which the Society has sustained in the death of Sir J. FREDERICK DICKSON, K.C.M.G., who for five years has been President of the Society, and, by the great interest he has taken in the affairs and his own wide knowledge of Oriental literature, has contributed so much to the Society's success and progress

During the year, the following new members have been elected:—

Mr. R. DANE.
The Hon'ble H. A. O'BRIEN.
Mr. H. VON PAPENDRECHT.
Mr. Justice GOLDNEY.
Mr. E. A. WISE.
Mr. F. J. OWEN.
Mr. E. B. HUTCHINSON.
His Excellency Major-General Sir CHARLES WARREN, G.C.M.G., K.C.B., F.R.S.
Dr. HAVILAND.
Mr. ROUNSEVELLE WILDMAN.
Mr. A. D. MACHADO.

We have lost by death Sir FREDERICK A. WELD, G.C.M.G., and Sir J. FREDERICK DICKSON, K.C.M.G.; and the following members have resigned:—

Mr. V. SERGEL.
Mr. H. W. C. LEECH.
Mr. E. KOEK.
Col. S. DUNLOP, C.M.G.
Mr. F. H. GOTTLIEB.
Dr. T. I. ROWELL.
Mr. O. MUHRY.

The Council have examined the Rules, and found that various alterations which had been already sanctioned by the Society had not been embodied in the printed Rules, and they recommend that the Rules should be reprinted correctly.

The usual number of Journals was published, containing papers on Ethnological and Natural History subjects. A new edition of the Map of the Malay Peninsula was published, which found a ready sale.

A large number of publications of kindred Societies were received in exchange for those of the Society, and correspondence and exchange has been opened up with the following additional ones:—

Royal Academy of Modena.
Society for the Exploration of Amurland.
Royal University of Upsala.
Natur-Historisches Museum, Hamburg.

The financial position of the Society is satisfactory, the balance at the bank being now $857.

STRAITS BRANCH OF THE ROYAL ASIATIC SOCIETY.

Dr. Honorary Treasurer's Cash Account from 1st January to 31st December, 1891. Cr.

		$ c.			$ c.
1891.	Balance on 1st January, 1891, ...	1,115 77	1891.	To paid for Koh Yew Hean Press for Paper, ...	180 00
	By Subscriptions for 1891, ..	509 47		,, ,, for setting up Journal No. 22, ...	138 00
	,, Subscriptions for 1888, 1889, 1890 and 1892, ...	85 00		,, ,, for Koh Yew Hean Press for Paper, ..	164 00
	,, Proceeds of Sales of Map of Malay Peninsula, ...	160 00		,, ,, for setting up Journal No. 23, &c., ...	270 00
	,, Proceeds of Sales of Journals,	19 50		,, ,, for Mr. C. D. Sherborn for Bibliography of Malaya (draft for £17 at 3/1⅛),... ...	109 90
	,, Proceeds of Sale of Notes and Queries, ...	0 15		,, ,, for revising Proof-sheets of Bibliography of Malaya, ...	10 00
	,, Proceeds of Sale of Hikayat Abdullah, ...	11 00		,, ,, for Advertising in local papers, ...	14 00
	,, Interest on Credit Balances with the Chartered Mercantile Bank, ...	13 45		,, ,, for Clerk's Salary from 1st January to 30th November, 1891, ...	110 00
	Carried forward,...	1,914 34		*Carried forward,...*	995 90

Honorary Treasurer's Cash Account from 1st January to 31st December, 1891,—*Continued.*

		$	c.			$	c.
1891.	*Brought forward,* ..	1,914	34	1891.	*Brought forward,*...	995	90
					To paid for Stationery, ...	8	16
					,, ,, for Postages, Cooly-hire and Petty Expenses,	46	45
					,, ,, Discount on Cheques and Bank Notes, ...	0	40
					,, ,, Balance in Chartered Mercantile Bank, ...	857	43
					,, ,, Balance with Honorary Treasurer, ...	6	00
	$	1,914	34		$	1,914	34

SINGAPORE,
25th January, 1892.

H. T. HAUGHTON,
Honorary Treasurer.

AN OLD MINUTE BY SIR STAMFORD RAFFLES.

THE following interesting record was recently found amongst some old documents in the Singapore Treasury. It is signed by Sir STAMFORD RAFFLES, and the concluding portion of the minute as well as the final signature are in the handwriting of that officer. The date is June, 1823, still legible as when it was written, but the day of the date has been eaten out of the paper.

The Proclamation and the Minute which follows it may accordingly be accepted as one of the first official utterances of the founder of Singapore, after the transfer of the island from the Government of Bencoolen to that of Bengal some three years before its amalgamation with Penang and Malacca.

Apart from its intrinsic value as a state paper, this document is interesting when we compare and contrast the present state of our laws with the provisions there indicated and foreshadowed nearly seventy years ago.

As the Minute is reprinted *in extenso*, I need only draw the reader's special attention to the author's views upon gambling, prostitution, registration of deeds, adulteration, the sanctity of oaths, and municipal regulation, amongst many other points touched upon. The doctrine of the liability of publicans may raise a smile, but it is a theory which still finds support amongst the apostles of temperance in England, where the legal sanction of the publican's errors lies only in the hands of the exponents of the licensing laws.

The Lieutenant-Governor's views upon deportation will, no doubt, be read with interest at the present time: while his brief remarks upon the characteristics of the Malay race, which he knew so well, are as deserving of study and acceptance to-day as when they were penned.

H. A. O'BRIEN.

Singapore, 7th August, 1891.

PROCLAMATION.

Provision having been made by Regulations Nos. III and IV of 1823 for the establishment of an efficient Magistracy at Singapore and for the mode in which local Regulations having the force of Law should be enacted, and by whom such Laws should be administered, it now becomes necessary to state the principles and objects which should be kept in view in framing such Regulations, and, as far as circumstances may admit, to apprize all parties of their respective rights and duties, in order that ignorance thereof may not hereafter be pleaded on the part of any individual or class of people.

The Lieutenant-Governor is, in consequence, induced to give publicity to the following Minute containing the leading principles and objects to be attended to:—

MINUTE BY THE LIEUTENANT-GOVERNOR.

As the population of Singapore will necessarily consist of a mixture, in various proportions, of strangers from all parts of the world having commercial concerns at this Port, though chiefly of Chinese and Malays, it would be impracticable for any Judicial Authority to become perfectly acquainted with the Laws and Customs having the force of Law which are acknowledged in their own countries respectively by the varied classes of so mixed a population, and to administer them in such a manner as to preserve them inviolate even in the mutual intercourse of those classes severally amongst themselves, far more so when justice is to be done between the Englishman and Chinese, the Bugguese and Hindoo, and the like. On the other hand, to apply the law of Europe direct, with all its accumulated processes and penalties, to a people of whom more than nine-tenths will probably be natives of China and the Malay Archipelago, would be as repugnant to universal and natural justice as it would be inconsistent with the benevolence and liberality which has ever marked the British rule in India.

Under these circumstances, nothing seems to be left but to have recourse to first principles, to use every precaution against the existence of temptation to crime that is found consistent with the perfect liberty of those who have no evil intentions, and when these precautions fail, to secure redress to the injured party, when possible, and such punishment as will be most likely to prevent a repetition of the crime, either by the party himself offending, or by those who may be inclined to follow his example. Nothing should be endured in the Settlement, however sanctioned by the local usage of particular tribes who resort to it, that has either a direct effect, or notoriously strong tendency to endanger the safety or liberty of person or the security of property, and in the same manner no want of what are considered legal formalities in any country should debar a person from having substantial justice rendered to him, *so that legal and moral obligation may never be at variance.*

Taking this as the fundamental principle for the Laws of the Settlement, it may be presumed that no local Regulation would be enacted that the society if left to themselves would not desire to see carried into effect; no public institution or source of expense would exist of which the benefit was not obvious to the enlightened part at least, if not to the whole body of the community, who would therefore soon feel that the Government was not made to tyrannize over the people, but for their protection and happiness.

Under such a system of administration, it is not unreasonable to expect that every facility would be afforded by the mass of the population to the Executive in carrying the Laws into effect, for even the midnight robber and swindler have no desire that their own persons or property should be liable to those evils which they inflict on the rest of the community, and will readily join in their suppression when other delinquents are the objects of the terrors of the Law.

In carrying such a system into effect, it ought to be fully understood and maintained on all occasions, that while individuals are allowed to *protect* themselves as far as possible against wrongs, the *redress* of wrongs cannot be left to the resentment or the revenge of the parties conceiving themselves injured. That must be done solely by Government through the instrumentality of the Judicial and Executive Officers whom it appoints for that purpose.

No one therefore being allowed to be a judge in his own case, or to revenge his own quarrel, arms or weapons capable of inflicting instant death as habitually worn by the Malays become unnecessary, and, by dispensing with them, the greatest temptation to and power of doing to others the greatest and irremediable wrong in depriving them of life is in a great measure removed. If a man takes another's horse or cow by robbery or theft or under a mistaken idea that he has a right to the property in question, redress can be afforded to him as soon as he is convicted of his crime or discovers his error, but if from revenge or under false impressions a man is suddenly excited to take the life of a fellow creature, it is in vain that he afterwards discovers that he was misled by passion or had been deceived by appearances. It often happens too in these countries that a man who considers himself aggrieved by a particular individual and finding himself in possession of a sharp weapon, attempts the life of every one he meets indiscriminately, and without having any wrong at their hands to complain of. It is impossible to see who may or may not be guilty of such acts of inhuman cruelty, and therefore all should agree to lay aside the use of the weapon that is commonly employed by persons who then transform themselves to wild beasts by giving way to brutal passion.

On the same principle, it has been found by experience that those who indulge frequently in gaming and cockfighting, are not only liable to engage in quarrels with those who have won their money, but also that they are incited to acts of fraud and robbery in order to obtain the means of amusement or of attempting to retrieve their losses; it is therefore the duty of Government to suppress both gaming and cock-fighting as far as possible without trespassing on the free will of private conduct. No man should be allowed to receive any money either directly or indirectly for conducting a gaming table or cock-pit, and winners of money at such places should be compelled to restore the amount to the losers, and should on no account be permitted to enforce payment from those with whom they have gambled on credit.

Intoxication being a source of personal danger to the community, and the indulgence in that vice being a frequent cause of betraying those who are addicted to it to the commission of acts of dishonesty, it is the duty of a good Magistracy to throw every obstacle in the way. In the first place the Officers of Police should be required to place in constraint any person seen in public in a state of intoxication until he becomes sober, and in the next place the vender of intoxicating articles who supplied him with the means of inebriety, should be visited with proof* and fined, and be liable to make good the amount of any loss which the person so intoxicated can prove he suffered during his inebriety from being unable to take care of himself; the extent of this fine must necessarily be discretionary on the part of the Magistrate, depending principally on the degree of inebriety produced; it should always be of such an amount that the fear of being subject to it may be sufficient to outweigh in the mind of the vender the temptation of profit in the sale of his goods; of course if it should appear in evidence that the individual was supplied with the means of intoxication for the purpose of taking advantage of him in that state, the object converts the simple misdemeanour into a crime according to the particular purpose contemplated, and further punishment to the guilty as well as redress to the individual injured must be awarded accordingly. The use of spirituous liquors, though innocent in moderation, becomes vicious when indulged in to excess; the consumption may be diminished by the enhancement of price, and in this way the indulgence may be made so expensive as to be only attainable beyond the bounds of moderation by those whose means give them a station in society that induces them to be guarded in their conduct for the sake of preserving the respect of those whose eyes are turned upon them; thus, while gaming as practised by the Chinese and cock-fighting by the Malays are absolutely pernicious in every degree in which they come under public cognizance, the use of opium and spirituous liquors may be repressed by exacting a heavy tax in the way of License from the venders.

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* *Sic,* probably "reproof."

There are many important considerations that stand in the way of enacting laws against prostitution, indeed it would, in a country where concubinage is not forbidden, be difficult to draw a line between the concubine and the common prostitute; it is practicable however in some degree, and highly desirable, that the temptation to profit should not exist to induce the seduction of women into this course of life by others of their own sex; the unfortunate prostitute should be treated with compassion, but every obstacle should be thrown in the way of her service being a source of profit to any one but herself. It should therefore be declared unlawful for any person whatever to share the hire or wages of prostitution or to derive any profit or emolument either directly or indirectly by maintaining or procuring prostitutes, as for any parent or guardian of a female or any other person to ask or receive directly or indirectly any reward for bestowing a female in prostitution, any custom, law or usage of the country in which such female or her parents or her guardians were born notwithstanding, reserving only for a jury to advise what constitutes a legal obligation on the man to support the woman thus bestowed, or in other words a contract of marriage by local usage and what a connection of prostitution; the penalty must here also be modified by circumstances. It is much more criminal to induct a girl into prostitution than to facilitate her pursuit of vice after she has entered upon it as a profession.

It may be necessary to make specific Regulations for the protection of the community generally against fire, both with regard to the construction of buildings, the storing of gunpowder and combustibles, the manufacture of arrack, &c., &c., the power of infringing on a neighbour's property after a fire has broken out either for the purpose of access to the means of extinguishing it or to prevent its spreading to a greater distance.

Boatmen and parties offering themselves publicly for hire may also be subjected to regulation with the view of facilitating the attainment of redress when they are guilty of fraud and negligence.

Weights and measures of the acknowledged standard should be accessible to all, and those used in purchases and sales ought to be in strict conformity with such standards. Certain Magisterial Officers, therefore, should be employed to examine those used by persons who openly keep goods exposed for sale. When found defective the person in whose behoof they are used should be liable to fine proportioned to his supposed means and the apparent degree of fraud resorted to.

Fraud with respect to the quality of articles is a crime more readily detected, and may be left to private prosecution. In giving redress to the individual, punishment ought to be annexed in proportion as the fraud is of an injurious nature.

As a great check to fraud and falsehood, a general Registry Office for all written agreements or engagements which are liable to be made the ground of dispute before a Court of Justice, should be opened for the public. Regulation should be made for the authenticity of the document in the first instance, and either party or any party interested should be entitled to a copy, paying for the same a moderate fee as a compensation for the trouble given to the Registrar and his Establishment. Precaution must of course be taken against the falsification or abstraction of such documents from the Registrar's Office. All deeds which may be so registered should have an avowed preference over one that is not so registered, unless the holder of the latter can shew a clear, distinct and satisfactory cause why he has not been able to have *his* deed registered and the *onus* of establishing this ought decidedly to rest on him.

Nuisances generally speaking may be safely left to the complaint of individuals in each particular instance where the cause of nuisance is not obvious to all, or directly injurious to particular individuals, as crowding the river with vessels, &c., when it may be made subject of special regulation.

All house-holders should be registered and all houses numbered; auctioneers and pawnbrokers should be placed under specific regulations, and none allowed to act as such without giving security for complying with the same and taking out a license for the purpose.

With respect to the employment of informers, it may be observed that Magistrates must have information, but no bad passion should be elicited in the procuring of it. No temptation to lead others to vice for the sake of reward for informing, no inducement to betray confidence, and the act of giving information should be treated as a public and honourable duty.

Precautionary measures being taken on the above principles for preserving the peace and good order of society and removing as far as practicable the immediate temptations to crime and violence, it next becomes necessary to define what shall be considered Crimes, what lawful punishments and how injuries shall be redressed.

By the constitution of England, the absolute rights of the subject are defined as follows:—

1st. "The right of personal security; which consists in a person's legal uninterrupted enjoyment of his life, his limbs, his body, his health and his reputation."

2nd. "The right of personal liberty; which consists in the power of locomotion, of changing situation or removing one's person to whatever place one's own inclination may direct, without imprisonment or restraint, unless by due course of Law."

3rdly. "The right of property; which consists in the use, enjoyment and disposal of all acquisitions without any control or diminution save only by the Laws of the Land."

There seems no reason for denying corresponding rights to all classes of people residing under the protection of the British Flag at Singapore, the Laws of the Land being such as are or may be enacted under the provisions of Regulation No. III of 1823, dated the 20th January last, with such others of a more general nature as may be directed by a higher Authority or which may necessarily accrue under the provisions of the Legislature and the political circumstances of the Settlement as a Dependence of Great Britain. Admitting these rights to exist, it follows that all acts by which they are invaded are wrongs, that is to say, crimes or injuries.

In the enactment of Laws for securing these rights, legal obligation must never supercede or take place of or be inconsistent with or more or less onerous than moral obligation. The English practice of teaching prisoners to plead not guilty, that they may thus have a chance of escaping from punishment, is inconsistent with this and consequently objectionable. It is indeed right and proper that the Court should inform itself of all the circumstances of a crime from witnesses as well as from the declaration of the prisoner himself. Denial is in fact an aggravation of a crime according to every idea of common sense. It disarms punishment of one of its most beneficial objects by casting a shade of doubt over its justice.

The sanctity of oaths should also be more upheld than in the English Courts. This may be done by never administering them except as a *dernier resort.* If they are not frequently administered, not only will their sanction be more regarded and in this way their breach be less proportionately frequent, but of necessity much more *absolutely* uncommon and consequently much more certainly visited with due punishment in all cases of evidence given before a Court of Justice.

The imprisonment of an unfortunate debtor at the pleasure of the creditor, by which the services of the individual are lost to all parties, seems objectionable in this Settlement, and it is considered that the rights of property may be sufficiently protected by giving to the creditor a right to the value of the debtor's services for a limited period in no case exceeding 5 years, and that the debtor should only be liable to imprisonment in case of fraud, and as far as may be necessary for the security of his person in the event of his not being able to find bail during the process of the Court and for the performance of the decree after judgment may be passed.

It is well known that the Malay race are sensibly alive to shame, and that in many instances they would prefer death to ignominy. That is a high and honourable feeling and ought to be cherished; let great care be taken to avoid all punishments which are unnecessarily degrading. Both the Malays and Chinese are a reasoning people, and though each may reason in a way peculiar to themselves and different in some respects from our own way of reasoning. This germ of civilization should not be checked. Let no man be punished without a reason assigned. Let the principles of British Law be applied not only with mildness but with a patriachal kindness and indulgent consideration for the prejudices of each tribe as far as natural justice will allow, but also with reference to their reasoning powers however weak, and that moral principle which, however often disregarded, still exists in the consciences of all men. Let the native institutions as far as regards religious ceremonies, marriage and inheritance be respected when they may not be inconsistent with justice and humanity or injurious to the peace and morals of society.

Let all men be considered equal in the eye of the Law.

Let no man be banished the country without a trial by his peers or by due course of Law.

Let no man be deprived of his liberty without a cause, and no man detained in confinement beyond 48 hours without a right to demand a hearing and trial according to due course of Law.

Let the people have a voice through the Magistracy by which their sentiments may at all times be freely expressed.

In fixing a scale of punishments, the first principle to be attended to is that they should be so graduated as to attach to each particular crime its due and relative punishment according to its enormity, and with regard to the nature of the punishments they should be as mild and humane as the general security of person and property admits of. Severity of punishment defeats its own end, and the laws should in all cases be so mild that no one may be deterred from prosecuting a criminal by considerations of humanity. No feeling interferes with justice in behalf of a murderer, let this crime be punished by death, and no other. Banishment is the next in order. Solitary confinement proportioned to the degree of the offence or pertinacity of the offender in his criminal course seems the least objectionable of all sorts of punishment. Disgrace may also be a form of punishment, but much caution is required in this respect lest a too frequent enforcement of the punishment destroy the feeling which can alone make it a punishment. Personal chastisement is only for the lower orders who are incapable of feeling the shame of disgrace and may probably be had recourse to in cases of wilful perjury where the falsehood of the witness is palpable and his object particularly mischievous. In all cases let it be considered as no less an object of the Law to afford redress to the party injured than to punish the offender. Compensation should in all cases, where it is possible, be made to the injured party to the extent of the means of the offender, as in the case of the Malay *Bangoon* where when the father is murdered the family are entitled to pecuniary compensation for his loss.

(Signed) T. S. RAFFLES.

With these views and principles the Lieutenant-Governor has this day transmitted to the Acting Magistrates such a graduated Scale of Crimes and Punishments as appears to him sufficient to meet the existing circumstances of the Settlement and to answer the end of substantial justice, with instructions that they will duly deliberate on the subject and after such revision as their local knowledge and experience may suggest, submit the same to the Chief Local Authority with their opinion, and in the form of a Code of Laws to be established for the Settlement and to be in force after publication by the Resident until rescinded by a higher Authority, or altered under the provisions laid down for the enactment of local Laws and Regulations.

The Magistrates have further been required to frame in the form of a Police Regulation, to be approved and published by Government, such further Regulations as may be advisable in that Department.

It is to be hoped that the provisions that will be thus made will be found sufficient for the public peace and the protection of person and property until circumstances may admit of the establishment of a more regular Court of Judicature, every arrangement that can be now made being necessarily of a provisional nature.

Dated at Singapore this day of June, 1823.

(Signed) T. S. RAFFLES.

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SOME NOTES ON THE SAKAI DIALECTS
OF THE
MALAY PENINSULA.

BY

HUGH CLIFFORD.

> "For the purpose of disclosing to us the real character of language left to itself to follow its own laws, "without let or hindrance, a study of Chinese and the "Turanian dialects, a study even of the jargons of the "savages of Africa, Polynesia and Melanesia is far more "instructive than the most minute analysis of Sanskrit "or Hebrew."
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> *"On the Stratification of Languages."*—MAX MÜLLER.

THE present paper deals with some of the jargons referred to by Professor MAX MÜLLER in the extract from the lecture above quoted, and as the dialects spoken by the largest Sakai tribes of the Peninsula have hitherto practically escaped observation, I trust that even the scanty data in my possession may prove of interest to the readers of this Journal. I do not propose to publish at the present time an exhaustive vocabulary of any of the dialects in question, as the material in my possession is not, in my opinion, sufficiently complete to render any publication that I could now make, of permanent value. I venture to think, however, that as duringthe last seven years I have visited many aboriginal tribes, and have collected vocabularies of their dialects in several parts of the Peninsula, many of the facts which I have ascertained, and the conclusions to which, in my opinion, these facts point, may be new and worthy of consideration by those who care for philological study. At some future date, when I have had further opportunities of perfecting and completing my grammar and vocabularies of Sakai dialects, I hope to be able to publish them in a form which will be more thorough and satisfactory than any which I could now attempt, and I shall, therefore, restrict myself in the present paper to a few notes on these dialects, and their connection with Malay.

In the same way, and for the same reasons, I shall not attempt to embody in this article any facts concerning the Semang or Pangan, as the Negritos proper are variously called by the Malays, and even in the Sakai dialects, I shall deal chiefly with the Sĕn-oi dialect, which is that with which I have the more intimate acquaintance, and which appears to be the purest form of Sakai extant.

Before going any further, however, it is necessary to clearly state that the aborigines of the Peninsula consist of people of two distinct races. The first, or Sakai, are a light-coloured, slenderly built people with the wavy, abundant hair, and in many cases the drooping nose of the Polynesian. The second, or Semang, who are true Negrito, are short, dark and thickset, with woolly hair, flat features, thick lips and general Negro characteristics. The former have attained a degree of civilization which is far superior to anything which the Negrito have reached. Sakai live in houses, and plant as well as hunt. The Negrito lives by his bow and blow-pipe alone, and lives in a temporary lean-to shed in spots where game is most plentiful. The Sakai affects to look down upon the Negrito, while the latter is a happy-go-lucky, cheery, little hunter who looks down on nobody.

The Sakai tribe is now split up into innumerable clans, each consisting of a few families, living in places surrounded by the Malays, and thus cut off from intercommunication with one another. These small clans, as might be anticipated, show many signs of the influence exerted over them by their Malay neighbours in their language and customs, and though it is comparatively rare to find them embracing the Muhammadan faith, still their civilization is more advanced, and they themselves are more degenerate than their brothers the Sakai of the far interior. There is a clan of Sakai in Kuantan (Pahang) which actually keeps a Malay *Pĕndekar* to teach the young idea the art of Malay fencing! This is an exceptional case, but, as a rule, when a Sakai has come to wear clothes he is morally a ruined man.

Among these clans the dialect spoken is so interspersed with Malay words and phrases, as to be merely a bastard form of the original tongue, and it is not from them that we can learn what the pure Sakai language is. A study of such mutilated dialects, except as a means of watching the rapid decadence of a barbarous tongue, would not repay the labour. Fortunately there is one large district in the Peninsula which is still purely Sakai country, the only permanent inhabitants being all of the Sakai race. This district is situated in almost the exact centre of the Peninsula, and comprises the head waters of the Jelai, Telom, and Serau Rivers in Pahang, the *ulu* of the Batang Padang, Bidor, Kampar, and Plus Rivers in Perak, and of the Galas and Nenggiri Rivers in Kelantan. This large tract of country having from time immemorial been almost exclusively peopled by Sakai, it is here alone that the pure Sakai is met with, and then only in the interior of the district, in places where the Malay language is still unknown. Here we find the Sakai tongue spoken as it has been spoken for generations, and containing comparatively few Malay words, or signs of the influence of the Malay language. Outside influence, as is well known, is a great modifier of all languages, and more especially of the dialects of a wholly unlettered people, and it is, therefore, a matter of some interest to find the Sakai in those places where such influence has scarcely had an opportunity of being brought to bear upon him, or where such disturbing elements have been reduced to an absolute minimum. Comparison with the dialects spoken by the scattered tribes, who have long been surrounded by Malays, shews that in the pure Sakai dialects many words are found which have been replaced by Malay words among the former tribes, and that the general purity of the language has been much destroyed by the introduction of foreign words or phrases.

For these reasons, I shall deal chiefly with the two dialects of Sakai spoken in the tract of jungle, or "Sakai country" above referred to, and shall only use the vocabularies collected in other parts of the Peninsula for purposes of comparison and illustration.

The two dialects here mentioned are called by the Sakai of the lower half of this district "Sĕn-oi" and "Tĕm-be'", respectively, though the term "Sĕn-oi" is applied to itself by each of the tribes in question, neither of which will allow that the other has any right to the appellation. The term "Gob" (a stranger) is applied to all mankind other than the hill-tribesmen, the term "Gob Mălâyu" being used for the Malays, "Gob Chî-na'" for a Chinaman, and "Gob Bî-ûg" (the white stranger) for a European. A line drawn from Blanja on the Perak River to the Bidor mountains, and thence to Kuala Nenggiri in the State of Kelantan, will roughly divide these two tribes from one another, the country South of this line being inhabited by Sĕn-oi, and the northern division by Tĕm-be'. Trade and other intercourse is carried on between the Tĕm-be' and Sĕn-oi, but though the dialects spoken are, in my opinion, undoubtedly mere variations one of another, still they differ sufficiently to render it impossible for a Sĕn-oi to understand a Tĕm-be' and *vice versâ,* unless either is familiar with the dialect of the other.

The grounds on which I base my statement as to the near connection between these dialects, and their intimate relation with one another, are the curiously close resemblance which exists between many of the more elementary words in both Sĕn-oi and Tĕm-be'. The following examples, taken almost hap-hazard from my Sakai vocabularies, will amply illustrate the above fact, and, in my opinion, are sufficient to justify the belief that both tongues are sprung from the same source, even if one is not a mere corruption of the other:—

English.	*Sĕn-oi.*	*Tĕm-be'.*
To eat	Cha'	Cha'
To go	Chîp	Chîp
To give	Ôk	Ôk
To take	Kod	Kod
To laugh	Lûk	Lûp

English.	*Sĕn-oi.*	*Tĕm-be'.*
Cooked rice	Cha'-na'	Cha'-na'
To be; to have, &c.	Mŭng	Moh
Fire	Ois	Ois
A bird	Chêp	Chêp
Earth-hand	Tê	Tê
A husband	Ĕn-sîrr	Sîrr
Down stream	Rêh	Rêh
A path	Nong	Nong
The head	Kû-i	Kû-i
The stomach	Kut	Kut
Jungle	Sĕ-râk^{n}	Sĕ-rok
High	Chĕ-rŭk^{n}	Jĕ-rôk
Tired ; fatigued	Gĕ-hêl	Gĕ-hêl
To ; towards, &c.	Ma'	Ma'

The above examples can easily be multiplied, but they are, in my opinion, sufficient to establish the intimate connection which exists between the Sĕn-oi and Tĕm-be' dialects : nevertheless it must not be supposed that all or even the majority of the words used by these two clans are equally similar to one another. The following specimens of common and elementary words will amply prove that this is not the case, although even in some of them I maintain that a near connection can also be traced :—

English.	*Sĕn-oi.*	*Tĕm-be'.*
I, me, we, us	Eng	Yêh
You, he, she, it	Hêh	Hâh
Come	Da	Bê
To do ; to make	Û-i	Êl
Smoke	Bi-chûl	Jĕt-jŏt
A lie	Pa'-ho'	Li-bus
A tiger	Rak^{n}	Ma'-nu
Flooring	Ching-karr	Nîs
A pillow	Tĕ-nû-i	Chĕng-kol
A mother	Mê	Boh
A father	Bî	Bĕr
A child	Kĕ-nod	Kwod
A blow-pipe	Bĕ-lau	Blâ-hû

English.	*Sĕn-oi*	*Tĕm-be'.*
To hear	Gĕr-têk	Kĕ-yok
A house	Dĕrk^{n}	Dêh
Good; pretty	Bor	Mêng
Here	Dih	Doh
Great; large	Ĕn-toi	Mĕ-nû

The numerals, which are a curious feature in Sakai dialects, also differ in Sĕn-oi and Tĕm-be'. No Sakai can count, in his own dialect, above three, and among the pure Sakai tribes of the interior no words are in use to express four, five, etc., a word which means "many, etc." being used for any number greater than three. The Sakai who are met with near Malay settlements have, for the most part, adopted the Malay numerals up to ten, but this is merely another instance of the influence which the Malays have exerted on the manner of thought, and consequently on the language of these savages. The numerals as known to the pure Sakai are as follows:—

English.	*Sĕn-oi.*	*Tĕm-be'.*
One	Na'-nu	Nêh
Two	Nar	Nar
Three	Nê	Ne'
Many, etc.	Kĕrp^{n}	Cha'-tuk^{n}

In only one case have I encountered a higher numeral than three among any of the aboriginal dialects of the Peninsula. The tribe in whose vocabulary a word for the numeral "four" was found lived, in 1885, in the jungles near Sadang on the geographical right bank of the Perak River, and consisted at that time of only seven members. I was told by the father of this family that he, his wife and his children were all who survived of a comparatively large clan, which, I make little doubt, will shortly be wholly extinct. Professor MAX MÜLLER tells of a traveller in South America who saw a parrot which was the only living creature that could speak some words of a forgotten tongue. A vocabulary which I compiled of this dialect will act the part of the parrot, and will shortly be the only record that such a dialect was ever spoken by man. This tribe called itself Semang as opposed to the Sakai tribes of

Lĕngkûas near Blanja, but its representatives differed very considerably in physical characteristics from the Semang of Ulu Perak, and the Pangan of Ulu Kelantan and Ulu Pahang. The following are the numerals in use among these Semang:—

English.	*Semang of Sadang.*
One	Nai
Two	Bêh
Three	Pat
Four	Sa-bêh

In other respects, however, this dialect was even more primitive than any Sakai language with which I am acquainted, no word being used for "male," "female" and many other elementary expressions.

As I trust that I have now been able to establish the near connection between the Sĕn-oi and Tĕm-be' dialects, I propose, in the following table, to give examples of twenty words found in four Sakai dialects collected in Perak and Pahang, which will, in my opinion, support my contention that the isolated or the scattered Sakai clans all speak languages which have a common origin, and which are closely connected one with another. Of the Sakai of the sea-coast, if indeed these people are really Sakai, and not some other race, I do not profess to treat, as I have had few opportunities of gaining any sufficient knowledge concerning them. The Sakai who speak the dialects, to which the table printed below refers, are all hill-tribes, or land Sakai, and all present the same physical characteristics which I have described in an earlier paragraph of this paper:—

	English.	*Sĕn-oi.*	*Tĕm-be'.*	*Blanja dialect.*	*Slim dialect.*
1	To sit	Gû-i	Gûl	Gû-i	Gĕr-i
2	That	Jîh	Nah	Jîh	Jîh
3	Recently; just	Pai	Pai	Pai	Pai
4	To throw away	Wêh	Gas	Gas	Gas
5	A pig	Gau	Gaur	Gau	Gau
6	To bring	Ên	Ên	Ên	An
7	A rhinoceros	Â-gâp	Â-gap	Â-gâp	Sĕ-jâp

	English.	*Sĕn-oi.*	*Tĕm-be'.*	*Blanja dialect.*	*Slim dialect.*
8	A dog	Cho'	Chû-or	Cho'	Cho'
9	A cloud; the sky	Râ-hu	Râ-hu	Sû-i	Râ-hu
10	To sleep	Bêt	Sĕ-log	Bêt	Bêt
11	Clothes	Â-bat	Â-bat^n	Â-bat	Â-bau
12	A wife	Kĕ-nah	Kĕ-nah	Kĕ-nah	Kĕ-nah
13	Water	Tê-u	Org	Tê-u	Tê-u
14	A river	Tê-u	Tê-u	Tê-u	Tê-u
15	Wood	Jĕ-hu	Jĕ-hu	Jĕ-hu	Jĕ-hu
16	A fowl	Puk	Ma'-nuk	Puk	Puk
17	The moon	Gĕ-che'	Gĕ-che'	Gĕ-che'	Bi-che'
18	To see	Neng	Neh	Neng	Nen
19	To fly	Gi	Guh	Gi	Gi
20	Female	Krĕ-dol	Ba'-bo'	Krĕ-dol	Krĕ-dol

The above examples will suffice for the purposes of illustration, and I may add that every dialect with which I have yet come in contact shews an equal resemblance to one or other of the two principal variations of the Sakai language—the Sĕn-oi and Tĕm-be' dialects. Leaving the question of the connection which I maintain exists between the various Sakai dialects and sub-dialects, I shall now turn to an examination of some of the characteristics of the Sĕn-oi language, which I have selected as being the form of Sakai with which I have the more intimate acquaintance.

This dialect is spoken by about 6,000 people who, as already stated, inhabit the lower portion of the Sakai country, and many of the isolated clans speak dialects which are merely modifications of it. In its grammar, and in its range of sound, it is merely a type of all Sakai dialects, and the vowels and consonants necessary to transliterate it are common to all these jargons.

A fact which strikes the observer as curious in the Sakai dialects is that in so primitive a tongue so vast a variety of sounds should be found. In Sĕn-oi there are the vowels *a, e, i, o* and *u,* each of which has four variations, viz., medium, long (^), short (˘), and abrupt ('), with the exception of *u* which has no abrupt tone.

a is pronounced like the vowel sound in *calm,* ex., Da=to come.

â is pronounced like the vowel sound in *blast,* ex., A-gap=a rhinoceros.

ă very short *a* sound, ex., Am-cha'=to eat; Dăk=to bear, to support.

a' similar to sound of the final *ak* in the Malay word *Banyak* in the dialects in which the *k* is silent, ex., Pa'-ho'=to lie; Ma'=to, towards.

e as in the English word *get,* ex., Jel-jol=to hang.

ê as in the French word *est,* ex., Jêk=an axe; Nê=three.

ĕ a very short *e* sound, ex., Rĕn-tak=the tongue; Mĕ-nang=a younger brother or sister.

e' similar to the *e* sound in the Malay word *Chapek,* the *k* being silent, ex., Nya'-ne'=a ghost, a spirit.

i as in the English word *hit,* ex., Kĕ-mit=a mosquito.

î similar to the vowel sound in *cheat,* ex., Ku-î=language, speech; Î-ok^{n}=to fall.

ĭ a very short *i* sound, shorter than in the English word *hit,* ex., Bĭ-lut=to extinguish; Bĭ-jog=wet.

i' as in the Malay word *badik,* the *k* being silent, ex., Si'=to fell.

o as in *ox,* ex., Sok=hair.

ô as in *broken,* ex., Shôk=the navel; Ôk=to give.

ŏ shorter than the *o* in *ox,* ex., Dĕng-dŏk^{n}=a branch.

o' similar to the final *ok* in *puchok,* the *k* being silent, ex., Da'-do'=sufficient, enough.

u similar to the vowel sound in *moon,* ex., Nyun=near; Ku-rul=the knee.

û similar to the *u* sound in *acute,* ex., Kû-ish=a porcupine; Dûl=the handle of a weapon.

ŭ rather shorter than the *u* sound in *hug,* ex., Krĕ-rŭg=to pull or pluck out.

In addition to the above vowel sounds, there are the semi-vowels *w* and *y*, pronounced as in English, ex., Wêk=to shoot with a bow; Wîh=do not!, desist!; Yat^{n}=a grandfather; Yap=to speak.

There are also the diphthongs *ai*, pronounced *eye*, ex., Pai=recently, just, only just; Laish=an ant.

au pronounced like the vowel sound in *how*, ex., Pĕ-lau-i=a star; Bĕ-lau=a blow-pipe.

oi pronounced like the vowel sound in *boy*, ex., Sĕn-oi=a man; Chĕ-noi=a post.

The consonants are as follows, and are similar to those in English, in so far as their value is concerned:—

b, ch, d, g, h, j, k, l, m, n, p, r, s, t, and *z*.

These consonants combine as follows:—

ng similar to the Malay ڠ, ex., Ngĕn-tap=the testicles; Mêng=the cheeks.

ny similar to the Malay پ, or the Spanish *ñ*, ex., Nyûh=heavy; Nyun=near.

sh, which is equivalent to the Malay ش, ex., Kĕ-lêsh=a mountain; Jîsh=daylight; Shôk=the navel.

There are two distinct *r*'s in Sĕn-oi—one, which is guttural, pronounced very deep down in the throat, I have rendered *r*, ex., Râ-hu=the sky, the heavens; Rĕj-ă-roj=lost, to lose one's way: and the other, which I have rendered *rr*, is a rolled *r* more pronounced than the rolled *r* in French.

Another peculiarity of Sĕn-oi is the existence of what, for want of a better name, I have termed "nasal finals." These are final k^n, final p^n, and final t^n. They are pronounced by closing the lips and emitting a very slight nasal *n* sound in a descending tone after the final *k, p* or *t* has been articulated. A similar sound is found, I believe, in the Hottentot dialects, but I have as yet had no opportunity of comparing Sakai with the African tongues.

Every syllable in Sakai is pronounced separately and distinctly, with a kind of catch between each, and when Malay words are adopted into the dialect, they too are always split up into their component syllables.

The grammar of the language appears to be simple. The following are the principal rules :—

I.—The nominative precedes the verb it governs.

II.—The accusative follows the verb which governs it.

III.—Adjectives and demonstrative pronouns follow the noun they qualify.

IV.—The cases are formed by the use of prepositions, with the exception of the genitive case, which is formed by placing the possessor immediately after the thing possessed. The idea *at, to, towards* is rendered by the preposition *Ma'*. The idea *on* and *from* by the preposition *Kĕn*. These prepositions (with the additional particle *Pă=aī, ow*) are found to exist in the same or in slightly modified forms in all the dialects of Sakai with which I am acquainted.

V.—There are no inflections of nouns or conjugation of verbs, but the cases are indicated by the personal pronouns, and the words and tenses by means of the auxiliaries Hôt=to wish, to want, and Tĕ-lâs=to be done, over, done, finished, enough.

The following sentences will illustrate all the above rules :—

(i)	Eng	cha'	cha'-na'.		
	1	2	3		
	I	eat	rice.		
	1	2	3		
(ii)	Hêh	tĕ-lâs	kuh	ka'	jîh.
	1	2	3	4	5
	He	has	killed	that	fish.
	1	2	3	5	4
(iii)	Derk^{n}	êng	bê	ma'-chut.	
	1	2	3	4	
	My	house	[is]	very	small.
	2	1		3	4
(iv)	Ôk	i-ôdz	êng	ma'	hê.
	1	2	3	4	5
	Give	my	chopper	to	him.
	1	3	2	4	5

(v) Hê chîp ma' lor.
1 2 3 4
Where [are] you going (*Lit.*, You go to where ?).
4 1 2

(vi) Êng hôt chîp ma' ta'.
1 2 3 4 5
I [am] going upstream (*Lit.*, I wish to go to the interior).
1 3 1 2 3 4 5

(vii) Hê gû-i kĕn tê nyun derk^{n} jîh.
1 2 3 4 5 6 7
Sit you upon the ground near this house.
2 1 3 4 5 7 6

(viii) Êng pai hôl kĕn rê.
1 2 3 4 5
I [have] just arrived from downstream.
1 2 3 4 5

(ix) Ia-lok mĕ-nang êng hôt chîp ma' sĕ-rak^{n} bort chêp.
1 2 3 4 5 6 7 8 9
To-morrow [my] brother will go to [the] jungle [to]
1 3 4 5 8 9
catch birds.
6 7

(x) Bi-chûl â-bat^{n} sĕn-oi.
1 2 3
Smoke [is] the garment [of the] Sakai. (a Sĕn-oi
1 2 3
proverb).

The above will, I hope, give a sufficiently clear idea of the manner in which Sĕn-oi sentences are formed, but before passing on to other matters, there are one or two peculiarities of the Sĕn-oi dialect which I should like to mention. One is the extraordinarily close resemblance which exists between many words in this dialect, and which, at first, is very puzzling to one who has to compile his own grammar and vocabulary of these aboriginal tongues. The following examples will illustrate this peculiarity with sufficient clearness :—

Cho' = A dog
Choh = To void
Chôk = To stab
Chôk^{n} = A root, a rattan
Dol = To place, to set down
Dûl = The handle of a knife
Êng = I, we
Ên = To bring
Hol = A small black ape—the *siamang* of the Malays
Hôl = To arrive
Ka' = A fish
Kah = To cut, to gash
Kol = Pith
Kôl = To fall down
Kû-i = The head
Ku-î = Language, speech

The colours which have names in the Sakai language are as follows :—

Rĕ-ngah = Black
Bi-ûg = White
Chĕng-ul = Red

All dark colours are included under "Black ;" green, blue, mauve, &c. under "White ;" and crimson, orange, yellow and brown under "Red."

Hitherto all efforts to connect the Sĕn-oi dialects with any other tongue have failed, so far as my attempts are concerned, but I have now arranged to procure some further vocabularies for purposes of comparison, and hope to be able to discover a connection either with the Papuan dialects or with some of the jargons spoken by the Dyaks or other aboriginal tribes of the Malay Archipelago. The statement made by Mr. VAUGHAN STEVENS that the Sakai dialects were closely connected with the language of Thibet is totally incorrect. After a careful comparison of the grammars and vocabularies of the two tongues, I am in a position to state that they have neither a root nor a grammatical form in common. Thibetan is a polysyllabic language with an elaborate grammar, which in no point is similar with anything found in Sakai or Semang. The language spoken by the latter people I hope to be able to connect with the inhabitants of the Andaman Islands. The physical characteristics of the two people are strikingly similar, and a comparison of their dialects will be full of interest. It would be somewhat premature, however, to do more than study the Sakai dialects themselves, and, as already stated, I have not hitherto succeeded in finding a single root in common in any of the vocabularies (including that of the Veddahs of Ceylon, which would appear to be a bastard Indian dialect) which I have as yet been able to examine.

There is yet another point on which I should wish to touch before concluding these notes. I refer to the connection between Sakai and Malay. In the introduction to his *Malay Manual,* Mr. W. E. MAXWELL has propounded a theory to the effect that some Malay roots may possibly be derived from Sakai. He says:—"Another characteristic list of words might "be made compounded with the monosyllable *Tang* (which in "Sakai and Semang means 'hand'), and conveying an idea "of seizing or holding. Tang-an=the hand; Tang-kap=to "seize," &c., &c.

Now, in Sĕn-oi the word for "hand" is *Terk*^{n} and in Tĕmbe' it is *Pîh.* Semang dialects are absolutely distinct from Sakai, having but few roots in common, and in no dialect that I know does the word *Tang* occur meaning a "hand." This being so, I should be disinclined to accept Mr. MAXWELL'S theory, the more so as there is much evidence to prove that at the time the Malays first penetrated into the Peninsula and other Malay countries, they spoke a language which, both in its words and in the rules by which its substantives were formed, did not differ appreciably from the Malay of to-day.

The names *duri-an*, the thorny fruit, *rambut-an,* the hairy fruit, and *pulas-an,* the twisted fruit, were all given to the fruits in question (which are indigenous in the Malay countries alone) by a people in whose language the words *duri*, a thorn, *rambut*, hair, and *pulas*, to twist, were all accepted terms, and at a period when the inseparable affix *an* had come to be employed for the formation of substantives as it is to the present day. The language being thus formed when the Malays first arrived in the Peninsula would preclude the possibility of the Malay language deriving elementary roots from Sakai dialects. Among the Sakai tribes, too, *sem-pa,'* a durian, has no connection with *tĕr-lâk*ⁿ, a thorn, and the names for the other fruits are equally distinct, and seeing that even to the present day the durian groves of the far interior are one of the principal factors in the Sakai's annual food supply, it is only to be expected that the name of so important an article of food should be one of the first elementary words to be embodied in the language of a primitive people dwelling in the Malay Peninsula.

But the evidence leads us further yet. Most people who have travelled in the interior of the Peninsula have seen the stone implements which are frequently discovered by the natives. These implements, called *batu halilintar* or thunder bolts, by the Malays, who believe them to be the bolts hurled from the heavens during storms, are of three kinds—stone axes, shaped somewhat like the Malay *blîong;* spear-heads; and choppers. At the present day similar tools wrought in metal are sold to the Sakai by the Malays, but it is a significant fact that they are all called by Sakai names by the aborigines. The following are the names in question:—

English.	*Malay.*	*Sĕn-oi.*	*Tĕm-be.'*
Axe	Bliong	Jêk	Jêk
Spear	Lembing	Ta-rok	Bĕ-lush
Chopper	Parang	I-ôdz	I-ôdz

Now, in spite of VOLTAIRE'S famous saying that "*pour Messieurs les étymologistes les consonnes ne lui coûtent rien et les voyelles bien peu de chose,*" I doubt whether any one will maintain that any connection exists between the Malay and aboriginal words for these implements. But the Malays also sell hatchets (*kapak*) to the Sakai, and this implement, which has no equivalent among the stone implements of the Peninsula, is called by the Malay name, *ka'-pak* being the Sakai modified form. Now these facts, I contend, point to the conclusion that at one time the tools made of stone were used by the Sakai and bore the names which are now given to the metal tools, of a similar shape, introduced by the Malays. That the metal weapons were introduced by a foreign race is proved by the fact that even to this day the pure Sakai have no knowledge of the art of fusing metals. That the Malays were the race which introduced these metal tools to the Sakai is rendered more probable by the fact that the weapons for which equivalents do not occur among the stone implements bear Malay names as already stated. If this point is allowed, there remains no alternative but to accept, what in my opinion is an undoubted fact, viz., that the Malays invaded the Peninsula at a period when they had attained to a considerable degree of knowledge in the useful arts, and their language formed in its essential characteristics, and that, therefore, the Malay language does not, and could not possibly, owe anything (saving perhaps the names of a few plants and beasts) to Sakai roots.

In the above remarks I have had occasion to state that the word *Kapak*, a hatchet, is adopted by the Sakai and becomes *Ka'-pak* as pronounced by the aborigines. Now this needs a word of comment, as it has frequently been remarked with surprise that the Sakai in adopting Malay words ending with *k*, which letter is silent in the dialects of the Peninsula, always give the silent *k* its full *written* value. Among other edifying deductions which have been drawn from this simple fact, it has been gravely argued that the peculiarity has arisen from the fact that the Malays of the Peninsula at some former period spoke as do their neighbours of Borneo and Sumatra, who pronounce all final *k*'s. That the Sakai learned it at that period, and have never abandoned the practice, though why they should have retained a peculiarity of pronunciation which the Malays of the Peninsula have relinquished, was not explained.

Now, the true explanation of this matter really is that in Sakai there are certain phonetic laws, of which the Sakai themselves are unconscious, but which, so far as I yet know, are employed without exception in all cases where Malay words are adopted into Sĕn-oi. These rules can be stated, but not explained, any more than it can be told why in Malay words with an initial *s* form the verb by dropping that letter and substituting *meny* مڽ. In both Sakai and Malay it is probable that euphony to the native ear is alone responsible for such rules. In Sakai the following are the phonetic changes which words adopted by the aborigines from Malay undergo, according to the original termination of the Malay word:—

(I) All Malay words split up into component syllables.

(II) A final vowel becomes that vowel in its abrupt (') form. Thus, *luka,* a wound, becomes in Sĕn-oi *lu-ka'*.

(III) Final *m* becomes final nasal p^n. The vowel in the last syllable sometimes changing from *a* to *u*. Thus, *jeram,* a rapid, becomes *jĕ-rup*^{n}.

(IV) Final *ng* becomes final nasal k^n. Thus, *kuching*, a cat, becomes *ku-chik*^{n}; *cherang*, a clearing, becomes *chĕrak*^{n}.

(V) Final *ak*, *ek*, *ik*, *ok* and *uk* in Malay, though silent in that language, are pronounced as they are written and not as they are pronounced by the Malays of the Peninsula.

The reason for rule (V) is apparent. The *Malay sound* of the finals written *ak*, *ek*, *ik*, *ok* and *uk* are already in use by the Sakai for another class of words adopted from the Malay, as will be seen by rule (II) above. As stated in rule (IV), k^n, the only other appropriate sound, is employed for words adopted from the Malay ending in *ng*. The only resource left to the Sakai is, therefore, to pronounce the *k* in order to distinguish between the final *a*, *e*, *i*, *o* or *u*, and the final *ak*, *ek*, *ik*, *ok* and *uk,* and this is accordingly done.

I have now written all that I think it advisable to publish at the present time, and finally I will briefly recapitulate the conclusions which, I think, are shewn to be probable, if not certain, from the evidence which I have submitted. Firstly, then, I hold that the Sakai all speak various dialects of a common tongue; secondly, that they are more ancient inhabitants of the Peninsula than are the Malays; and lastly, that the former have not derived any elementary roots from the Sakai.

15th September, 1891.

AN ACCOUNT OF A JOURNEY ACROSS THE MALAY PENINSULA FROM KOH LAK TO MERGUI.

BY

ARTHUR KEITH, M. B., C. M.

FULLY a century ago much of the traffic between Siam and the West passed over the Malay Peninsula between Mergui and Koh Lak, and in the month of June of this year, having occasion to visit Mergui, I chose this old route. In those olden days carriages with ladies riding in them and driven by cockaded coachmen were wont to pass to and fro by this route, but the remains of the old road that can be seen to-day lead one to suspect that such a statement was the gloss some old writer put upon the rustic, squeaking bullock-carts with their native drivers that wore their hair cut in a shoe-brush fashion by way of a cockade. In those days Tenasserim stood at the terminus on the Burmese side, then the capital of a kingdom and often spoken of as a Venice of the East, for she possessed a large fleet of vessels that carried her commerce all over the Bay of Bengal, while at the Siamese terminus, Koh Lak sheltered many junks and big boats that carried the overland traffic to Ayuthia or to Bangkok and further if necessary. But the rapid transit brought about by steam has killed this trade, Tenasserim is little better than a memory, a white man is a rare sight in Koh Lak, and the jungle has seized and made much of the road its own again.

Koh Lak itself is a small island rising from the sea like a rudely splintered church tower, but on the adjacent mainland is a small town bearing the same name. Along the sea-board here, are numerous small patches of paddy fields with rude bamboo houses, raised high above the ground, scattered amongst them, and numerous water-buffaloes feeding in the deserted clearings. Looking westwards, some ten miles distant, one can see Khow Maun (known on the Burmese side as Khow Mordaun) rising from the ridge that divides Siam from Burma, over the shoulder of which the path we were to take turned. It was then the 7th of June, and the South-West Monsoon had set in, and although upon the East side of the Peninsula not a drop of rain was falling, we could see heavy masses of vapour lying upon the West side of the hills, and evidently rain falling plentifully on there.

My guide, who had been known to me for over two years as a miner and hunter at Bangtaphan, was a Siamese with a dash of Burmese blood in him and had relations living on both sides of the Peninsula whom he visited frequently, and known to those of the Siamese side as *Nai Yeet,* to those in Burma as *Moung See.* He would assent gravely to the most improbable statememts, and the real state of matters never stood a moment in his way from putting them as he thought they were wanted to be. He had announced this road as eminently suited for elephants, and that a pony might go along, so that I was tempted to travel at ease. Luckily I had with me another man, NUAN by name, a most faithful Siamese and quite an ornament to the skin he wears.

Having followed the coast line from Bangtaphan northwards to Koh Lak, we there turned inland and made for the pass across the hills at Khow Maun. For the first four miles, a rough dray-path led us over a shallow, level, damp soil carrying a stunted jungle clear overhead, so that we made a swinging pace. But at the end of the four miles the path ended in a clearing in the jungle covered with tall lalang grass and full of shallow pools, and for the following five miles we followed an irregular footpath that wound through the jungle. The soil was here deeper and drier, and the trees grew larger and offered great obstruction to our passage. Before entering this footpath we noticed by the wayside a small clearing covered with green grass and where probably had stood a rest-house for travellers. After leaving the houses on the coast we passed but one human habitation, some six miles inland—the house of one of those men that live by the produce of the jungle. Darkness was beginning to fall when we emerged from the ill-marked footpath on to a deeply rutted dray-path that wound up the slopes of Khow Maun, and by the side of this path we spread our *kajangs,* and spent the night.

MOUNG SEE said the path before us was now free from all obstruction, but as he had made the same statement every morning for the last four days, and as we had found it utterly false—for it had cost us an immense amount of labour to bring the elephant that distance, owing to the obstruction offered by the numerous low branches across the road—I went in front to inspect the path, and at the shoulder of the hill found that it was completely obliterated by the jungle. On the slope of the hill the rains kept the road scoured, so that vegetation could not spring up on it, but on the shoulder of the hill, the soil being left at peace, was soon seized and grown over. Sending the elephant and all superfluous baggage back, and taking a waterproof coat, a blanket, a gun, rice and fish for five days, as well as other things necessary for my business at Mergui, NUAN, MOUNG SEE and I set out together.

On the side of Khow Maun, along this dray-path, are many shallow trenches running round the hill as if at one time an army had encamped there. Just on the shoulder of the hill, a few large spreading trees shelter a considerable expanse of sward, whereon at one time stood a temple—a rest-house for the overland travellers. Near by, in a ravine a little lower down, is a well with excellent clear water, for all the streams were dry, and we had been drinking from the buffalo pools, which the natives held drinkable if there was no marked odour, so that this water was very welcome. The country here is granitic, full of deep narrow ravines, and here and there we saw the deep cuttings that had been made to carry the old road through them.

There is a steep ascent for the last two or three hundred yards before gaining the top of the pass, which is about 750 feet above the sea level, and where there is a mound covered with all sorts of idols, but the prevailing type was a small, very fat clay elephant set upon exceedingly stunted limbs. This was an altar to the spirit of the hills, and NUAN and MOUNG SEE coming up, stooped down and made their obeisance, and NUAN in a prayer informed the spirit of my state and station, and begged he would not think hardly of me for having but two followers, and told him of the more numerous retinue I had brought away with me, and finally concluded his prayer with this promise "and now if you will give us a safe conduct to Muang Meerit (Mergui), and keep us from robbers, tigers and " all the other ills that beset travellers, we will make a great " deal of *merit* when we safely reach our journey's end."

On the Burmese side everything was wet with the constant drizzle. The rain clouds must hang very low, for the range of hills here are very little over one thousand feet in height, yet they are high enough to determine the rainy season on either side. From a glimpse through the trees, which we got descending from the pass, we could see that the country in front of us was entirely covered with forest jungle, with hills in the distance. The foot-path leads down a gentle descent, and at the foot of the hills we found the country uneven, cut up by ravines, with a deep alluvial soil covered by a lofty evergreen forest. We reached a stream about seven miles from the pass, and, beneath a large tree with very thick foliage, upon its bank we spent the night.

About ten o'clock a downpour of rain commenced. I drew my water-proof coat over my blanket, while NUAN and MOUNG SEE crouched over the fire; but the wet began to steal in all round and the rain drowned the fire, so that we waited anxiously for morning to break. As soon as we could see, we packed up our things and set out, the rain coming heavier than ever. For five miles we went through a luxuriant bamboo jungle, where we started a herd of wild buffaloes, and jungle fowl were abundant, but as we had only a Colt's repeating rifle with us we were unable to procure any for our pot. By the side of the path were the ruins of a brick temple, which at one time must have been rather an elaborate structure, and there the men again made their obeisance.

When we emerged from the bamboo jungle we struck a stream coming from the S. E., shallow and about thirty feet wide. On its left bank were three dilapidated huts, where probably Chinamen or natives had resided while prospecting the stream which is reported to carry gold. We followed this stream—the *Klong Pan Peng*—for some distance, then crossed and recrossed it several times, until we reached an open space in which there was a rude hut called by MOUNG SEE " the house of the father of the buffaloes." The rain cleared away, and we had time to dry our clothes and cook some food before it set in again, and continued all night.

The soil here is deep and carries lofty trees with a rich and thick undergrowth of trailing and twining plants. Ever since leaving the bamboo jungle leeches lay thickly in wait for us, but next day they surrounded us like besetting sins. On the path in front one could see a perfect little forest of miniature elephant trunks nodding on the ground, and no railway guard catches the moving foot-board so cleverly as they catch the traveller. In a clearing an attempt was was made to rid ourselves of the enemy, but they boarded us quite as quickly as we could throw them over. Few travellers pass this way, and how these crowds get a living I do not know.

Here and there, through this part of the jungle we came on small pieces of green sward surrounded by large trees, and sometimes we passed larger clearings. Evidently people had at one time a habitation here, and even now, during the dry season, herdsmen drive their cattle up from the lowland flats of Burma to graze in these patches and in the bamboo jungle.

About seven miles from the field of the father of the buffaloes, this stream from the S. E., which we had followed and crossed, joins a large stream from the N. E., and just at the junction of the streams our path ran into the river. After half a day's fruitless search for it on the further side of the river amidst a constant downpour, we recrossed to a sand bank, on which we threw up a hut. We were fortunate enough, during our search for the path, to find a turtle weighing some 45 ℔s. feeding in a marsh by the river. He seemed sadly astonished when the two men started to remove his breast plate, but he ought to have congratulated himself on escaping the sad fate of the small land tortoise which is invariably cooked by being hung over a fire and roasted alive.

The rain continued all night, and next morning the river was so flooded that we could not cross it. So a council was held and we determined to build a raft of bamboos with which to proceed down the river, although NUAN objected sadly to trust himself to the mercy of the river spirit. By four o'clock over forty bamboos had been cut, lashed together in three tiers, so that the raft had rather the appearance of a rather broad ladder. We were anxious to test its capabilities, and foolishly started that night. It went swiftly and smoothly along the flooded stream until a difference of opinion between NUAN and MOUNG SEE landed it broadside on a small island in the middle of the stream, and in a moment we were over and in the water. Luckily I had tied everything to the raft with the exception of my only pair of shoes, and when the raft was righted we found they were gone and everything soaking wet. Darkness came down, so we moored. The rain was constant; our clothes, blankets and matches wet; and the best piece of ground we could get was damp and marshy, so that we longed all night for the light of morning.

The country now became covered with jungle-clad ranges of hills, set closely together, separated only by the narrowest ravines, and rising up some 500 feet or more. These hills ran right across the course of the river, so that it seemed to dash against the first range, then eddying along its flanks burst through the first vulnerable point it reached and dashed against the next range, where it again searched for and found an exit, and so bounding and turning, rushing and eddying, it at last burst through this hilly country and sailed out on the flatter country beyond. It took us a day and an half to get through this tortuous channel, sixteen hours punting at 2½ miles an hour, so that to reach a point some fifteen miles distant as the crow flies we had to cover about forty.

After spending such an uncomfortable night, we found ourselves just at the entrance to this hilly country. The river was now in big flood, and the rapids were full of great boulders, against which the river dashed itself. Below those rapids came great silent whirlpools in the shadow of the hills, so deep that our long bamboo punt poles failed to reach the bottom, and our raft rotated again and again. It required all our energies and wits to shoot those rapids, and often we bounced against the snags and jutting boulders, coming off as a rule with but slight damage to the raft, but more than once we were on the eve of complete disaster, when we got righted almost by miracle.

We had just shot a rapid, and were taking matters easily after our exertions, when our attention was suddenly attracted by a thundering tearing noise as of some large animal bursting through the narrow coppice between the hill and the river. Presently a great male banteng (*Bos frontalis*) appeared on the bank about fifty yards behind us, plunged into the flood and made swiftly for the other side. At one time he looked threateningly towards us, so we were glad to get rid of the brute, but just as we were turning the next bend we again heard the thunder of his hoofs, and he instantly appeared on the bank quite opposite us. As he plunged into the river the men threw their punt poles from them and cowered on the raft, while I hastily undid the fastenings of my gun and loaded it. But by that time the bull had thought better of it and had made across the river just in front of us and was ascending the opposite bank as I took a flying shot at him, but he disappeared evidently none the worse. The beast, I believe, had not the slightest intention of molesting us; but the hills threw their steep sides so close to the river, that he had to cross and recross to get along the narrow bank that was sometimes on one side sometimes on the other.

A little after midday the rain ceased, and in a blink of sunshine that followed, we dried our matches and shortly afterwards moored our raft and prepared to spend the night. We made a great fire, dried our clothes and blankets, cooked the

the last of our rice, and threw up a rude roof of leaves, so that when the rain fell with the darkness we were prepared for it.

It required some cajoling to get NUAN to again trust his life on the raft, for said he "Last night the river spirit came"—here NUAN held out his hands and shook his head quite despondently. But the river was the only way out of the hills; we knew dwellings could not be far off, and the river had abated somewhat; these and other inducements allowed us to again resume our journey in the morning. Early in the forenoon we came upon tracks of honey and gum-dammar collectors, and at midday we sailed out between two hills that stood as sentinels to a flat, jungle-covered country with small rounded hills scattered over it. The soil was deep and eminently suited for agricultural uses, but we saw no vestige of cultivation until the day was well spent, when we suddenly came upon a small settlement of houses. These bamboo houses were evidently of recent erection, and stood amongst plantains and maize, which grew amongst the fresh trunks of lately felled trees. The inhabitants were Siamese, most of whom had recently come over from the Provinces on the East coast, and many of them had worked as miners at Bangtaphan. Siamese priests had come up from Wat Kew, an old Siamese settlement a day's journey down the river, and had taken advantage of the flood which had made the river navigable for big boats to visit this outlying Colony of their parishioners and collect their tithes. All night long the old priest with his two young brethren were fêted, so that we were allowed to spend the night there in comparative peace.

Next morning the priests set out for their 'Wat,' and we obtained permission to occupy part of the boat. A little further down we reached a larger village, also a Siamese Colony—for the Siamese occupy the valley of this river down to Tenasserim. There the priests stopped to take their midday meal. The headman told me he had been settled there for upwards of eight years, and that he came from the Province of Koowi. The soil, he also informed me, was much richer than any on the East Coast, and that they cultivate only a little rice, devoting their time more to the raising of bananas and maize, which they sell down the river, and besides they keep a good few buffaloes. I have no doubt also they enjoy the security of property and freedom from oppression under British protection.

After they had finished their meal we set out again, the young priests '*chowing*' the boat while the old man reclined within. Round about him, built in great piles were the worthy man's presents from his parishioners, consisting of great heaps of half roasted fish, baskets full of sweetmeats and fancy cakes, bags of rice and bunches of bananas, betel-nuts and coco-nuts 'galore,' in fact stores large enough to hold a great priesthood eating for weeks. In fact, so full was the boat of good things (and I believe the priests were quite as full) that, although the boat was a fairly large one, there was neither room to sit or stand, and it was quite a treat to see the old priest's little boy scrambling amongst those things to supply the betel-nut wants of his superior.

The river got wider, deeper and flowed more slowly, but the surrounding country was still of the same character—flat and jungle-covered, with rounded hills here and there. By landing some distance above Wat Keo and walking over a neck of land, we were able to cut a good few miles of the river and reach the 'Wat' that night, where we slept. A beautiful park surrounds the abode of the priests, and the Wat is built after the Burmese design, but all the priests are Siamese, some of them coming from the Provinces on the East Coast. The village of Wat Keo (or Takay as it is called on the maps) has about 400 inhabitants, mostly Siamese, and is surrounded by large paddy fields and extensive pasture land. NUAN had now an opportunity of fulfilling his vow, for in his hour of danger he had promised the water spirit, at the first Wat he reached, to make merit to the extent of ten ticals, but now was quite convinced it was a rash promise and considered three ticals quite enough.

Next morning we left Wat Keo and proceeded further down the river. Only two house-boats were available, both belonging to local trading Chinamen, and these, practising their usual policy on the stranger, extracted three times the customary amount, and no doubt divided the profits. Moreover the boat was small, one had to crawl into it, and when there lie on one's back. The Chinaman was an old Perak miner who had come up to Mergui, married a woman of the country, started trading on the river, and now had two daughters to assist him in 'chowing' the boat.

The following morning we arrived at Tenasserim, once the proud capital of a kingdom of that name. Its ruler, its power, its people and its fleet are all gone, and all that remains to mark its ancient claims of a Venice of the East is the dilapidated remains of a terrace leading up from the river. The inhabitants are mostly Burmese and do not number more than 600, and there seems to be no life in the place. Yet it occupies a situation surpassingly fine. The foot of the high bank on which it sits is swept by the smaller Tenasserim River, which a little below the town bends to meet the larger river coming circling from the North and enclosing between them an expansive 'haugh' of green sward. The 'haugh', the circling rivers and the town are enclosed in a circuit of forest-clad hills, so that Tenasserim sits on the South side of an amphitheatre.

Just as we were leaving Tenasserim, two little Burmese boys came running down to the boat and asked in good English "Where are you going, Sir?" They were wonderfully intelligent lads; they attended school in Mergui, but were then home for holidays, their father being a merchant in Tenasserim.

The river between Mergui and Tenasserim is broad and deep, in many parts it really looks like a series of lakes surrounded by hills; and here and there along its banks are fishing villages. During the rainy season steam launches, drawing four or five feet of water, can go to Tenasserim, and formerly one of the British India steamships used to pass up the river to within eight miles of Tenasserim, where her further passage was prevented by a bar of rocks that cross the river there.

The mouth of the river is surrounded by numerous swampy mangrove-covered islands, and sailing along these we came in sight of Mergui next forenoon. The town contains about 15,000 inhabitants, and is the capital of the southern part of Lower Burma. The Government houses are situated on a small plateau that rises from the town with the native houses—mostly built of wood—round it reaching down to the water's edge. The inhabitants are mostly Burmese, but Chinamen are the active traders.

NUAN went ashore and procured me shoes and other necessaries, and fitted me out more as a Chinaman than as a European, to face civilization. I was most hospitably entertained by Mr. BATTEN and Mr. HUGHES, and after a few days left on board the S. S. *Mergui* to return to Bangtaphan *viâ* the isthmus of Kra.

THE THERMAL SPRINGS OF SELANGOR AND MALACCA.

BY

DR. W. BOTT, F.C.S., F.G.C.S., &c.

THE following account represents a brief summary of the results of two official visits to Selangor and Malacca undertaken in August and November, 1890, respectively. Many of the results have already appeared in the report published by Government. A great many details—such as description of apparatus employed, methods of collecting gases, and analytical methods used, which really form the most valuable part of the paper from a strictly scientific point of view—have been omitted, as being obviously not suitable for publication in this Journal; these will be found in the complete paper which will shortly be published in England and Germany (Proc. Royal Soc. and Berlin Chem. Soc.). In reference to the analytical data given, I wish to point out, that these only represent the approximate composition of the water of the springs, owing to unavoidable admixture of ordinary surface water in most cases. I hope at a future date to be able to visit these springs again, provided with such apparatus and appliances as will enable me to collect the water absolutely free from foreign admixtures. The numbers given, however, if not absolutely true, will, I believe, be found to require but a trifling correction in each case.

GENERAL NATURE OF THE SPRINGS.

All the springs visited by me and described more fully later on, belong to the class of "Simple Thermal Waters," viz., they are characterised by a high temperature, but do not contain any considerable amount of dissolved mineral matter. This circumstance, and the small amount of lime in the water, seems to indicate that all these springs rise from silicious and not from calcareous tracts, although no strictly reliable relation can ordinarily be established in such cases between the chemical nature of a spring and its ultimate source. The immediate and obvious surroundings of the springs are old granitic formations. This also applies to those springs which are situated in padi swamps, and where granite, though not apparent, is found below the mud surface. In addition to common and porphyritic granite, quartz, as rock and pebbles, diorite, gneiss and greissen (a kind of granite practically free from felspar which often forms the matrix of tin lodes) are found, but limestone is not apparent. The latter remark, however, does not apply to the springs of Ulu Selangor, which I was unable to visit in person.

The springs themselves appear as pools or puddles of hot water, varying in area from 1 to 3 or more square yards, and generally fed by two or more distinct streams or jets issuing from holes and crevices in the bottom of the basin. Bubbles of gas are observed continually to emerge with these jets and ascend through the supernatant hot water. These consist essentially of nitrogen and carbon dioxide with a small quantity of hydrogen sulphide and traces of hydrogen and marsh gas. The presence of hydrogen sulphide is apparent from the sulphurous smell in the vicinity of the springs and the water itself owes to this gas a slight smell and taste. The beds of the springs consist of granitic rock more or less decomposed on the surface and coated with silicious sinter. The floor of these beds is covered with all kinds of loose vegetable and mineral debris in the form of granular sediment or soft fibrous and gelatinous masses. The latter accumulate in parts and often form a thick continuous layer on the surface of the water having a green and in some cases a bright orange red colour. The consistency and general appearance of this substance varies from a loose, fibrous structure resembling soft, dense moss, to a gelatinous, homogeneous texture not unlike India-rubber. A careful microscopical examination of these masses showed that they consist of decayed organic matter derived from leaves and other vegetable substances which find their way into the water and undergo decomposition at a comparatively high temperature. They represent a dense magma of cells of most variable shape and appearance, reprensentative of almost every kind of vegetable cell in existence. How far this growth may be looked upon as a whole, as an individual, as a living thing increasing actively, or a dead product growing passively by mechanical addition,—these are questions of considerable interest, to be settled by a separate investigation, and I hope to discuss this subject fully in a future paper. In several specimens of the vegetable matter from Ulu Klang and Setapak, a distinct form of algæ was found, and I have since been informed, that similar specimens had been found in Ayer Panas water, Malacca, and sent to the British Museum for examination. It appears, however, that this has led to no further results. The temperature of the springs ranges from about 100° to 185° F. in Selangor, and 95° to 130° F. in Malacca. It varies moreover in each spring according to the distance from the feeders, being highest at the point where they enter.

A number of complete analyses were made of the air in the vicinity of the springs. The air was found to be of normal composition though free from active oxygen or ozone. Air collected close to the springs was found to contain traces of hydrogen sulphide and rather more than the normal amount of carbonic acid and ammonia. The details of these analyses will be given subsequently.

All the springs contain a considerable amount of dissolved silica. On keeping samples of the water part of this is deposited in a pulverulent state, sometimes, however, very thin, soft, transparent, glistening films separate from the water and these on analysis are found to consist of silica, organic matter and traces of sulphur.

SPRINGS IN SELANGOR.

SETAPAK SPRING.

Temperature,	47-50° Centigrade (118-122° Fahrenheit).
Total solids dissolved in water,	18.35 grains per gallon.
Chlorine,	0.4 ,, ,,
Hardness,	3.6 ,, ,,
Free Ammonia,	0.036 parts per million.
Albuminoid Ammonia,	0.10 ,, ,, ,,

The quantity of dissolved constituents amounts to 3.10108 parts in 10,000 of the water, viz. :—

Calcium Carbonate,	0.23	parts in 10,000.
Calcium Sulphate,	0.25	,, ,,
Magnesium ,,	0.014	,, ,,
Sodium ,,	0.21	,, ,,
Potassium ,,	0.08	,, ,,
Sodium Carbonate,	0.43	,, ,,
Ammonium ,,	0.00108	,, ,,
Sodium Chloride,	0.043	,, ,,
Potassium ,,	0.005	,, ,,
Lithium ,,	trace	,, ,,
Sodium Sulphide,	0.025	,, ,,
Boric Acid,	trace	,, ,,
Carbonic Acid,	0.71	,, ,,
Nitrogen,	0.09	,, ,,
Hydrogen Sulphide,	0.034	,, ,,
Organic Matter,	0.120	,, ,,
Silica,	0.859	,, ,,
	3.10108	,, ,,

The gases escaping from the spring were collected and analysed, giving the following percentage composition :—

Nitrogen,	97 %.
Carbonic Acid,	2.5%.
Hydrogen Sulphide,	0.5%.
Hydrogen,	trace.
Marsh Gas,	,,
Total,	100.00.

A number of analyses were also made of samples of air collected close to the spring, and the following mean results were obtained :—

Oxygen,	20.885%	by volume.
Nitrogen,	79.115 ,,	,,
Carbonic Acid,	0.06 ,,	,,
	100.060	

The ammonia was determined separately and amounted to 0.055 parts by weight in 1,000 of air. The air near the spring differs consequently from ordinary air slightly by containing a little more carbonic acid (0.06%, as against 0.03 to 0.04 in normal air).

GOMBAK SPRING.

Temperature, ... 50-54° Centigrade (122-129° Fahrenheit).

Total solids dissolved in the water, 21.333 grains per gallon.

Hardness,	3.6	,,	,,
Chlorine,	0.55	,,	,,
Free Ammonia,	0.04	parts per	million.
Albuminoid Ammonia,	0.05	,, ,,	,,

Total constituents dissolved in 10,000 parts of the water, 3.9942, viz. :—

Calcium Carbonate,	0.26	parts in	10,000.
Sodium ,,	0.22	,,	,,
Ammonium ,,	0.0012	,,	,,
Calcium Sulphate,	0.285	,,	,,
Magnesium ,,	0.016	,,	,,
Sodium ,,	0.199	,,	,,
Potassium ,,	0.093	,,	,,
Sodium Chloride,	0.065	,,	,,
Potassium ,,	0.012	,,	,,
Lithium ,,	...		
Sodium Sulphide,	0.018	,,	,,

Hydrogen Sulphide,	0.030	parts in 10,000.
Boric Acid,		
Carbonic Acid,	0.81	,, ,,
Nitrogen ,,	0.08	,, ,,
Organic Matter,	0.09	,, ,,
Silica,	1.765	,, ,,
Total,	3.9942	,, ,,

Composition of Gases escaping from Spring.

Nitrogen,	98.1%	by volume
Carbonic Acid,	1.9%	,,
Hydrogen Sulphide,	0.3%	,,
	100.3	

Composition of Air close to Spring.

Oxygen,	20.90%	by volume.
Nitrogen,	79.10%	,,
Carbonic Acid,	0.06%	,,
	100.06%	

SEMUNIAH SPRING.

Temperature,	45-50°C. (113-122° F.).	
Hardness,	3.4	grains per gallon.
Chlorine,	0.5	,, ,,
Total solids dissolved in the water,	20.5	,, ,,
Free Ammonia,	0.04	parts per million.
Albuminoid Ammonia,	0.05	,, ,,

Constituents contained in 10,000 parts of the water:—

Calcium Carbonate,	0.21	parts in 10,000.
Sodium ,,	0.1900	,, ,,
Ammonium ,,	0.0015	,, ,,

Calcium Sulphate,	0.2800	parts in	10,000.
Sodium ,,	0.2010	,,	,,
Magnesium ,,	0.0190	,,	,,
Potassium ,,	0.0800	,,	,,
Sodium Chloride,	0.0700	,,	,,
Potassium ,,	0.0100	,,	,,
Lithium ,,	trace	,,	,,
Sodium Sulphide,	0.00900	,,	,,
Hydrogen ,,	0.0400	,,	,,
Boric Acid,			
Carbonic Acid,	0.7600	,,	,,
Nitrogen,	0.0900	,,	,,
Organic Matter,	0.1200	,,	,,
Silica,	1.4000	,,	,,
		,,	,,
Total,	3.4805	,,	,,

Composition of Gases from Spring.

Nitrogen,	96.00%	by volume.
Carbonic Acid,	3.00	,,
Hydrogen Sulphide,	0.70	,,
Hydrogen Marsh Gas,	0.30	,,
	100.00	

Composition of Air close to Spring.

Oxygen,	20.85%	by volume.
Nitrogen,	79.08	,,
Carbonic Acid,	0.07	,,
	100.00	

Ammonia contained in air close to spring=0.12 in 1,000 parts by weight.

Dusun Tua Spring.

Temperature,	45-50° C. (122° F.).
Total solids dissolved in water,	15.4 grains per gallon.
Hardness,	2.3 ,, ,,
Chlorine,	0.25 ,, ,,
Free Ammonia,	0.04 parts per million.
Albuminoid Ammonia,	0.03 ,, ,,

Constituents contained in 10,000 parts of the water:—

Calcium Carbonate,	0.1357	parts in 10,000.
Sodium ,,	0.08000	,, ,,
Ammonium ,,	0.00053	,, ,,
Calcium Sulphate,	0.11400	,, ,,
Sodium ,,	0.09900	,, ,,
Magnesium ,,	0.01200	,, ,,
Potassium ,,	0.06300	,, ,,
Sodium Chloride,	0.05100	,, ,,
Potassium ,,	0.00400	,, ,,
Lithium ,,	trace	,, ,,
Sodium Sulphide,	0.00900	,, ,,
Hydrogen ,,	0.03200	,, ,,
Boric Acid,	trace	,, ,,
Carbonic ,,	0.92000	,, ,,
Nitrogen ,,	0.07000	,, ,,
Organic Matter,	0.04031	,, ,,
Silica,	0.61200	,, ,,
Total,	2.20141	,, ,,

Gases escaping from Spring.

Nitrogen,	96.5%	by volume.
Carbonic Acid,	2.9	,,
Hydrogen Sulphide,	0.4	,,
Hydrogen and Marsh Gas,	traces.	

Composition of Air close to Spring.

Nitrogen,	79.04
Oxygen,	20.91
Carbonic Acid,	0.05
Total,	100.00

ULU SELANGOR SPRING.

Temperature, ...	100.2% F. (38 C.).	
Hardness, ...	3.5	grains per gallon.
Total solids dissolved in the water,	19.5	,, ,,
Chlorine, ...	0.5	,, ,,
Free Ammonia, ...	0.16	parts per million.
Albuminoid Ammonia, ...	0.12	,, ,,

Constituents dissolved in 10,000 parts of the water:—

Calcium Carbonate, ...	0.2100	parts in 10,000
Sodium ,, ...	0.1800	,, ,,
Ammonium ,, ...	0.0025	,, ,,
Calcium Sulphate, ...	0.1900	,, ,,
Magnesium ,, ...	0.0180	,, ,,
Sodium ,, ...	0.1850	,, ,,
Potassium ,, ...	0.0600	,, ,,
Sodium Chloride, ...	0.0700	,, ,,
Potassium ,, ...	0.0090	,, ,,
Lithium ,, ...	trace	,, ,,
Potassium Iodide, ...	trace	,, ,,
Sodium Sulphide, ...	0.0090.	
Hydrogen* ,, ...	not determined.	
Boric Acid, ...	trace.	
Carbonic Acid,*	not determined.	
Nitrogen,*	,,	
Organic Matter, ...	0.1100	parts in 10,000
Silica, ...	1.2000	,, ,,
Total,...	1.2135	parts in 10,000

Composition of Gases from Ulu Selangor Spring and surrounding Air.

Not determined, as I did not visit the spring in person.

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* These constituents were not determined, as I did not personally visit this spring, and they can only be correctly estimated in freshly collected water. Judging by analogy they would differ but slightly from the amounts under "Gombah."

Ulu Klang Spring.

Temperature,	83-84° C. (181-183° F.).
Hardness,	2.0 grains per gallon.
Chlorine,	0.45 ,, ,,
Free Ammonia,	0.03 parts per million.
Albuminoid Ammonia,	0.04 ,, ,,
Total solids dissolved in the water,	21.95 grains per gallon.

Constituents dissolved in 10,000 parts of the water:—

Calcium Carbonate,	0.1600	parts in 10,000
Sodium ,,	0.1950	,, ,,
Ammonium ,,	0.0050	,, ,,
Calcium Sulphate,	0.1250	,, ,,
Magnesium ,,	0.0201	,, ,,
Sodium ,,	0.2200	,, ,,
Potassium ,,	0.0955	,, ,,
Sodium Chloride,	0.0500	,, ,,
Potassium ,,	0.0150	,, ,,
Lithium ,,	trace	,, ,,
Sodium Sulphide,	0.0200	,, ,,
Hydrogen ,,	0.0350	,, ,,
Boric Acid,	...	,, ,,
Carbonic Acid,	0.8050	,, ,,
Nitrogen,	0.0700	,, ,,
Potassium Iodide,	trace	,, ,,
Organic Matter,	0.0950	,, ,,
Silica,	1.5000	,, ,,
Total,	3.4606	,, ,,

Composition of Gases escaping from Spring.

Nitrogen,	95.85
Carbonic Acid,	3.50
Hydrogen Sulphide,	0.65
Hydrogen and Marsh Gas,	trace
	100.00

Composition of Air close to Spring.

Oxygen,	20.870
Nitrogen,	79.060
Carbonic Acid,	0.070
Hydrogen Sulphide,	trace
	100.00

(Ozone or active Oxygen absent).

Ammonia in air near spring, 0.11 parts in 1,000 parts by weight.

A sample of air was collected about 1½ miles from the spring, and the ozone in it determined.

The mean result of the separate experiments was 0.000,0011 milligrams per litre of air.

Composition of Rocks from the Spring.

It has already been stated that the formations in the immediate vicinity of the springs are granitic, the principal component minerals being accordingly :—Quartz, Felspar, Mica (Muscovite and Zinwaldite) and Hornblende.

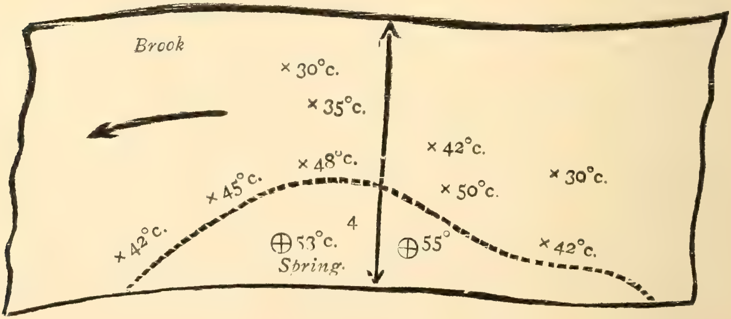
The average composition of the rock (from 6 analysis) is shown below :—

Silica,	74.30%
Alumina,	14.20 ,,
Alkalis,	5.10 ,,
Lime,	3.00 ,,
Magnesia,	0.60 ,,
Iron (taken as Ferric Oxide),	1.10 ,,
Moisture, Oganic Matter, Manganese, &c.,	1.70 ,,
	100.00%

Tin ore in varying though small quantities is found disseminated through the mass of some of the specimens. Gold was absent in all the samples I took, with the exception of a piece of Diorite found at Ulu Klang, which contained a quantity corresponding to ¾ oz. to the ton. I do not for the present attach any importance to this circumstance, as it may be a purely sporadic occurrence; yet it might be worth while to obtain a proper sample taken from a large quantity of the rock near Ulu Klang and have it tested for gold. I am not aware whether or not gold has ever been found or been supposee to exist at Ulu Klang.

SPRINGS IN MALACCA.

The springs found in Malacca in all respects closely resemble the Selangor Springs (*see* under General Nature of the Springs). One spring at Cherana Puteh is situated in the jungle, those at Ayer Panas and Alor Gajah occur in padi swamps. The latter two have been properly set for bathing purpose, so I can say nothing about their original condition and appearance. The spring at Cherana Puteh appears as a pool or puddle of hot water in a bed of dark grey mud from which bubbles of gas are continually ascending. At the time of my visit a little brook was flowing close to the spring and mixing with it to a certain extent. No line of demarcation between the brook and the water from the spring was visible, but could be readily detected with a thermometer; the differences observed are worthy of note (*see* sketch below).



It will be noticed that within small distances of a foot or even 6 inches the temperature varies very considerably. The points marked × indicate places where the temperature was taken, those marked ⊕ mark the entrance of feeders or "eyes" of the spring, and naturally possess the highest temperature.

SPRING AT AYER PANAS.

The temperature of this water varies considerably in the different tanks or wells in which the spring has been collected.

a.—Tanks inside house.
No. 1 = 45° Centigrade (113° Fahrenheit).
,, 2 = 35° ,, (95° ,,).
,, 3 = 45° ,, (113° ,,).
,, 4 = 52° ,, (123° ,,).

b.—Tank outside house on ground immediately adjoining.
No. 5 = 55° Centigrade (131° Fahrenheit).

c.—Tank in padi swamp behind house.
No. 6 = 52° Centigrade (125° Fahrenheit).

d.—Tanks in front of house in the field.
(Left) No. 7 = 33° Centigrade (91° Fahrenheit).
(Right) No. 8 = 48° ,, (118° ,,).

Analysis of water taken from hottest tank, No. 5:—

Total solids dissolved in the water,	18.40	grains	per gallon.
Hardness, ...	2.5	,,	,,
Chlorine, ...	0.7	,,	,,
Free Ammonia, ...	0.05	parts	per million.
Albuminoid Ammonia, ...	0.05	,,	,,

Constituents dissolved in 10,000 parts of the water:—

Calcium Carbonate, ...	0.160	parts	in 10,000
Calcium Sulphate, ...	0.180	,,	,,
Magnesium ,, ...	0.015	,,	,,
Sodium ,, ...	0.190	,,	,,
Potassium ,, ...	0.085	,,	,,
Sodium Carbonate, ...	0.450	,,	,,
Ammonium ,, ...	0.00018	,,	,,

Sodium Chloride	0.095	parts in	10,000
Potassium ,,	0.006	,,	,,
Sodium Sulphide,	0.020	,,	,,
Hydrogen ,,	0.025	,,	,,
Carbonic Acid,	0.585	,,	,,
Nitrogen,	0.085	,,	,,
Silica,	0.780	,,	,,
Organic Matter,	0.250	,,	,,
Total,	2.92618	,,	,,

Spring near Alor Gajah.

Part of this spring has been collected in a tank inside a little house, part of it rises in the bed of a little brook close to this house, and a third outlet has been set and received in a square bricked trough or well. The latter evidently (from its temperature, etc.) corresponds to the main feeder.

Temperature of water inside house,	35°	C.	(95° F.).
Temperature of water in the brook,	40°	,,	(104° F.).
Temperature of water in bricked well,	55°	,,	(131° F.).
Hardness,	2.5		
Total solids dissolved in the water,	1.7	grains per	gallon.
Chlorine,	0.5	,,	,,
Free Ammonia,	0.04	parts per	million.
Albuminoid Ammonia,	0.05	,,	,,

Constituents contained in 10,000 parts of the water:—

Calcium Carbonate,	0.200	parts in	10,000.
Calcium Sulphate,	0.140	,,	,,
Magnesium ,,	0.025	,,	,,
Sodium ,,	0.150	,,	,,
Potassium ,,	0.095	,,	,,
Sodium Carbonate,	0.550	,,	,,
Ammonium ,,	0.00015	,,	,,
Sodium Chloride,	0.075	,,	,,
Potassium ,,	0.005	,,	,,
Lithium ,,	trace	,,	,,

Sodium Sulphide,	0.019	parts in	10,000.
Hydrogen ,,	0.020	,,	,,
Carbonic Acid,	0.480	,,	,,
Nitrogen,	0.075	,,	,,
Silica,	0.590	,,	,,
Organic Matter,	0.295	,,	,,
	2.71915	,,	,,

Spring at Cherana Puteh.

Situated in a piece of jungle with bed of soft mud mixed with particles of quartz and granite. A little brook of cold water flows close to the spring and partly mixes with it.

Maximum temperature, 55° C. (131° F.).

Analysis of a sample of the water after simple filtration to remove suspended matter :—

Total solids dissolved in water, 22.5 grains per gallon.

Hardness,	4		
Chloride,	0.7	,,	,,
Free Ammonia,	0.04	parts per	million.
Albuminoid Ammonia,	0.06	,,	,,

Constituents dissolved in 10,000 parts of the water :—

Calcium Carbonate,	0.250	parts in	10,000.
Calcium Sulphate,	0.270	,,	,,
Magnesium ,,	0.015	,,	,,
Sodium ,,	0.185	,,	,,
Potassium,	0.095	,,	,,
Sodium Carbonate,	0.320	,,	,,
Ammonium Carbonate,	0.000180	,,	,,
Sodium Chloride,	0.100	,,	,,
Potassium ,,	0.090	,,	,,
Lithium, ,,	trace	,,	,,
Boric Acid,		,,	,,
Sodium Sulphide,	0.025	,,	,,

Iron, Alumina and Manganese,	0.125	parts in 10,000.
Hydrogen Sulphide, ...	... 0.019	,, ,,
Carbonic Acid, ...	... 0.450	,, ,,
Nitrogen, ...	... 0.089	,, ,,
Silica, ...	... 0.595	,, ,,
Organic Matter, ...	... 0.195	,, ,,
	2.82318	parts in 10,000

Composition of Gases escaping from the Springs.

A number of analyses were made of the gases which are given off by these hot springs, and they were found to consist principally of Nitrogen and Carbonic Acid with small quantities of Hydrogen Sulphide and Marsh Gas.

THERAPEUTIC VALUE OF THE SPRINGS.

In my remarks upon the general nature of the springs, I have already pointed out that they must be classed with simple thermal waters, as they contain but an insignificant amount of solid matter excepting Silica which has but little physiological action. All the springs, however, contain Hydrogen Sulphide, and although the quantity present is sufficient to warrant their being classed with "Sulphurous Waters" in the strict sense of the word, yet it suffices to impart to them a distinct therapeutic value. In addition to this, their temperature is an important item, considered medicinally. There are a number of well-known springs in Europe, which owe their virtues apparently to their temperature only and contain as little or less mineral matter than the Selangor springs and less Hydrogen Sulphide or none at all (Matlock; Buxton; Wildbad; Aix en Provence).

Among the Selangor springs Ulu Klang ranks first as possessing the highest temperature and containing most Hydrogen Sulphide. The remainder may be placed in order of merit thus:—Setapak; Dusun Tua; Semunieh; Gombah. Ulu Selangor would probably be the last in the list, although I cannot say so definitely, as I did not personally inspect and examine this spring. In any case it would come after Setapak

On reference to the data of analysis of the Ulu Klang and Setapak waters, it will be seen that they contain the following amounts of Hydrogen Sulphide dissolved in every 10,000 parts of the water :—

Ulu Klang,	... ... 0.035	(Temp. 151° F.).
Setapak,	... ... 0.034	(„ 122° F.).

Now the average amount of Hydrogen Sulphide in *cold* sulphurous springs may be taken as 0.090 parts in 10,000; hence the Ulu Klang and Setapak contain a very fair fraction of this amount and possess a high temperature at the same time. Both of them may, therefore, be recommended for bathing or drinking purposes. Their action would be stimulating and diaphoretic, and they would be found valuable in :—Chronic Skin Diseases and Rheumatism; Chlorosis; Amenorrhœa; Secondary Syphilis; Dyspepsia due to disordered action of the liver. I do not think it practicable to bottle and sell the water, as this would result in the loss of almost all its volatile and valuable constituents by evaporation and subsequent decomposition. The water should be used on the spot and as nearly at the temperature of the spring as may be found endurable.

The suggestions arising from the above are :—

I.—That the hot springs in Selangor, more particularly those at Ulu Klang and Setapak, are by virtue of their temperature and chemical composition therapeutically valuable.

II.—The springs at Ulu Klang and Setapak should be properly set and made available for bathing and drinking purposes. It is almost needless to say that every care should be taken to prevent any communication between the water used for bathing and drinking purposes respectively.

It should be mentioned here that the Malays and Chinese seem to be well aware of the virtues of these springs, and particularly of their specific action in skin diseases. They bathe in them freely, and I am informed that the Chinese more or less monopolise some springs, the Malays others. As far as I could learn they never drink the water.

Ultimate Origin of the Springs.

The geology of the springs is a subject of great interest, but unfortunately one not to be approached or settled in an easy, off-hand manner. Much patient study of actual sections in the immediate vicinity of the springs, examination of deeper strata by boring, in short a complete geological survey alone, can throw light upon this question. One is accustomed to associate hot springs with volcanic action, yet these springs occur in parts far distant from any known volcanic belt.

No basalt and no minerals indicative of direct volcanic action are to be found in the neighbourhood. The composition of the water is, in some respects, similar to the water ejected by the geysers of Iceland, but here the analogy ends. Beyond conjectures pure and simple, I can at present pronounce no opinion as to the final source of these springs, viz., the question of direct volcanic action or simple intra-terrestial heat. I sincerely hope, however, to have an opportunity to follow up this subject later on.

In conclusion, I wish to refer to a paper by Mons. STANISLAS MEUNIER published in J. cx, p. 1085 of the Compt. Rend. 'Examen chimique d'eaux minérales provenant de Malairé. Mineral d'etain de formation actuelle.' The paper describes the analysis of two bottles of water brought by Mons. J. ERRINGTON DE LA CROIX from Ayer Panas and Cheras, and contains the following statements among others :—

1.—The water had a bad smell on opening bottle.

2.—On heating it gave off gas bubbles.

3.—On evaporation it left a syrupy residue which was incinerated and gave two milligrams of ash per 100 cc. water taken.

4.—Exposed to the air for a few hours the water fills itself with white, viscous vegetations not botanically determined.

5.—The Ayer Panas water had no taste ; the Cheras water no smell, but a slightly saline taste, and on heating gave off myriads of gas, probably pure Nitrogen amounting to 10 cc. per litre.

6.—The water contained Chlorine, but no Sulphates, and about 1.4 grams Sodium Chloride per litre.

7.—A mineral found in the spring is described, having a spec. gravity 2.1, cavernous and tuberculous structure, whitish grey colour with small black dendritic particles in it. The composition of this is given as :—

Silica,	91.8 %
Water,	7·5 ,,
Tin Oxide,	0.5 ,,
Iron,	0.2 ,,
Aluminium,	traces
	100.0 ,,

From this the author draws the remarkable conclusion that this substance is a kind of opal similar to geyserite, but containing tin as a peculiar and characteristic constituent.

He goes on to say that this is the first time that tin has been found in *statu nascenti* as it were, viz., in the act of deposition from its mother liquor, and looks upon this as an important contribution to the theory of the formatiom of tin ore.

It needs but a glance at the statements above cited to show that they are of no value at all, in fact mostly absurd, but I append a few remarks upon these points, lest a casual reader of the paper should be deceived by them and attach credit to the grand but unfortunately erroneous deduction (No. 7) in which that paper culminates. It seems strange that matter so devoid of point and substance should have found its way into the Compt. Rend. :—

1. *Bad Smell.*—Most waters would have a bad smell after being carried from Selangor to France.
2. *Bubbles on heating.*—All water, unless specially treated, gives off bubbles on heating.
3. *Syrupy Residue on evaporation.*—The water leaves a *solid* residue. The ash is more than 4 milligrams per 100 cc.
4. *White, viscous vegetations.*—These are probably the

siliceous deposits mentioned in my paper. They do not form in a few hours as stated, and the water does not *fill itself* with them.

6. *No Sulphates, but about 1.4 grams Sodium Chloride per litre.*—The water naturally contains Sulphates, and the Chloride amounts to 0.015 grams at most.
7. The description given is that of common sinter met with in all hot springs, almost without exception. As for the tin in it, it would be difficult in these parts to pick up a mineral which did *not* contain a trace of tin, as is well enough known. There is absolutely nothing remarkable in the presence of tin in this sinter, the very granite upon which it grows carries traces of tin. The bold theory of *tin oxide* being deposited from water containing *Sulphuretted Hydrogen* is not compatible with chemical laws, is a chemical impossibility.

I desire to add that I have appended the above remarks purely by way of correcting erroneous statements, and nothing is further from my thoughts than "sitting on" the author of them. It must be borne in mind that he could only work with a small sample sent to him in France, and which probably arrived in a more or less altered condition. He never saw the springs nor the water fresh from them.

W. BOTT.

NOTES ON THE SIAMESE PROVINCES OF KOOWI, BANGTAPHAN, PATEEO AND CHAMPOON.

BY

ARTHUR KEITH, M. B., C. M.

Their Position and Outstanding Features.

IN that part of the Malay Peninsula lying between 10° 20′ and 12° N. Latitude, the backbone range of hills almost skirts the East coast and thus between the hills and the sea lies a narrow strip of country, the northernmost part forming the province of Koowi; Bangtaphan, Pateeo and Champoon following in order towards the South. This backbone range, covered evenly over with deep jungle like the plain that lies between it and the sea, averages in height some 1,600 feet above the sea level, but at Khow Pra it reaches some 3,500 feet, while it attains 4,326 feet—its highest point—in Khow Luang, standing as the boundary wall between Burma and Siam. It is broken here and there by gaps, honoured by the name of passes, the best known of which perhaps is that of Kra, 250 feet above sea level, lying at the southern extremity of the piece of country of which I write, and frequented by the Siamese living in the Pak-chan valley when visiting their relatives in Champoon; while better known in former times and lying quite at the other extremity, the pass of Koowi, some 750 feet above sea level, affords the colony of Siamese living in the valley of the smaller Tenasserim River, a rude path to their native provinces on the East Coast. Between these two lie ill-marked crossings at Krat, Paron and Bangtaphanoi, the last being used by the Siamese living in the Lenya valley; but the truth of the matter is that the numerous bands of dacoits that infest this region cross anywhere (*vide* map). To the seaward of the main ridge, and for the greater part running parallel to it, are numerous small ranges, while scattered hills rise with their burden of forest jungle over the plain and thickly skirt the coast, often standing into the sea as promontories offering their bluff side to the waves; and one can see that the same features characterise the sea-bottom—the hills rising from the water as numerous jungle-covered islands.

Prominent Geological Features.

The basis of the backbone ridge is a rough-grained granite, rapidly decomposing when exposed to the atmosphere, and the streams flowing from it (as indeed is the case almost everywhere in the Peninsula) often carry *tin* and more frequently and more abundantly *titanic oxide* of *iron*. Lying on the granite and rising as the basis of the small ranges of hills is a semi-metamorphosed clay-slate much broken up, non-fossiliferous and probably of the Cambrian period, which forms the "country rock." To the seaward of this slate and lying on it, runs a great bed of conglomerate rock, composed of flat, water-worn slate pebbles and roughly rounded pieces of quartz welded together by a red clay containing much iron. Its stratification is much disturbed, and it sometimes rises into low hills. Where the slate and this conglomerate meet, one frequently finds great outcrops of a porphyritic rock evidently that of the Mergui series, and here also one finds large outcrops of gold-bearing quartz as in the concession of the Goldfields of Siam Company. Again it can be seen further South in Champoon where another mine has been opened out. (*Vide* Map.) In the beds of the streams running through these quartz-bearing parts, one finds gold, and sometimes for a mile or more inland from either bank alluvial gold occurs along its sides for long stretches, but from its comparatively even distribution and level deposition one has to look for some means other than the river to account for its presence here and thus. Still proceeding seawards, and having crossed this land of conglomerate, one again comes to the "country rock"—metamorphosed clay slate. On the coast, laterite is abundant, often forming low cliffs, but the hills skirting the sea and most of the islands are of a limestone that gives forth a metallic ring when struck.

Limestone Hills and Caves.

About a mile to the West of the village of Bangtaphan, raising its somewhat flattish top some five hundred feet above the surrounding alluvial plain with its old sea beaches, is a rather typical limestone hill with a sloping side to the land, and like others of its kind, a steepish side to the sea sheltering the mouths of numerous caves of various sorts and sizes. To gain the principal cave, one ascends some fifty feet to find the mouth as sharply cut as, and somewhat after the manner of, a cathedral door, and as the cave retreats from its mouth it increases in every dimension. The floor, running backwards for some 80 feet, mounts in three great tiers some 60 feet wide, the last and highest tier being sacred to a gilt Bhudda with a perfect myriad of leaden apostles round about him, for the cave is used as an occasional place of worship, as these caves commonly are in Siam. The roof rises in vaults, the highest of all rising to some forty feet and is pierced by what the Scottish people familiarly know as a "Hell's Lum." From the shape of the caves, from those "Hell's Lums." and from their situation on the steep side facing the sea, one naturally concludes they are the result of sea-action. One can see lines, more or less parallel to the surface slope of the hill running along the walls of those caves, as if they demarcated concentric layers which had been deposited by some spring that rose in the centre of the hill, overflowed, and laved its sides, and the not uncommon nearly concave top lends some support to such a guess. It seems highly probable that out of the solidified debris in the floors of those caves, animal remains, recent or otherwise, might be obtained, although a search made in those of Borneo (see the Society's Journal for

1879)—was practically negative, but the religious purposes to which these caves are put deters one from actively pursuing operations.

These limestone hills and caves seem fairly well distributed along either coast of the Peninsula—seldom I believe rising many hundred feet above sea level. On the West coast away as far North as Moulmein, one finds similar hills with famous caves—also used as temples; in the Lenya valley again there are said to be some remarkable specimens, and there are others in Selangor, Kedah and Pahang, besides in many of the islands lying along that coast. In the four Siamese provinces they are common, and at Pateeo a group of these limestone hills rises from the sea like a great set of decapitated sugar cones, while away much further North beyond these provinces, at Petcheburee, there is a famous cave containing a gigantic wooden image of Bhudda. Among the islands and shores along the Eastern side of the Gulf of Siam one comes across them, while they abound in North Borneo.

The Rising of the Land.

Assuming then that these caves are the result of sea-action, as in all probability they are, and seeing that some of them are now high and dry some hundred feet or more, we may conclude that the land has at any rate risen that amount in recent times. A writer in this Journal for 1879, discussing those limestone hills and caves in North Borneo, concludes that that part of the island had risen about 500 feet in recent times, and before I saw that article I had concluded that at any rate the land in these four provinces lying three hundred feet above the sea level had emerged from the water in a recent era. MASON, in his work on Burma, gives it as his belief that the Burmese coast is rising, and states that the land on the other side of the Bay of Bengal is sinking. Probably the whole great tract of country—almost the whole of the Indo-China Peninsula—over which this limestone formation occurs is rising; at any rate that small part of which I write, I believe to be in course of elevation. In the great flat plain, sloping from the hills to the sea, one finds extensive beds of clay almost of one level and sloping towards the sea, and over this again great beds of evidently sea-rolled gravel also comparatively at one level and of an even thickness, lying some 450 feet above the present sea level. The hills have their sloping sides to the mainland, and their steep sides—often sea-marked cliffs—to the sea. Then again (see vertical section across Province of Bangtaphan at lower right-hand corner of map) going towards and within two miles of the sea, one crosses undulating and wavy old sea beaches of sand following each other in rapid succession. Lem Tong Lan (*vide* section) is a hill standing out to the sea with the usual characteristic shape and joined to the land by a muddy isthmus, over which old inhabitants say it used to be possible to sail at high water with a boat, which is now impossible. The section running through Koh Yeu shows that island with its sloping side in very shallow water towards the land, while that towards the surf is steep and faces deep water. The shape of those islands and hills, this little tongue of land joining Lem Tong Lan to the mainland, these old sea beaches, the limestone caves, and the other recent geological formations even in the absence of recent marine remains, seem to point to the land having risen and still to be rising, but of course in this extension seawards of the land deposition has played a considerable part.

The River System and the Effects of Deposition.

In this narrow strip of country the rivulets from the main range and subsidiary hills meet on the plain below to form considerable streams which, running over beds of sand and gravel, make on the whole a straight course across the plain to the sea. One of those streams has seldom more than 150 square miles of a drainage area, but the river of Champoon, like the large streams draining the other side, and like the rivers of the Peninsula in general, runs parallel to the main range of hills for the greater part of its course until, near its termination, it turns outwards to end in the sea, and thus drains an area of about 450 square miles—three times that of any of the other streams. On the West side, on the other hand, with an area almost three times as great to be drained, the place of those babbling small streams is taken by comparatively large rivers; the Pak Chan has a drainage area of 600 square miles, the Linya 800 square miles, and the smaller Tenasserim River has over 2,000 square miles of a drainage area. These rivers on the West side, with their large drainage areas, receiving a rainfall fully double that of those smaller ones on the East coast, and carrying an infinitely larger volume of water with its inherent properties of disintegration, denudation, transportation and deposition, represent powerful factors at work on the Burmese side almost absent in these four Siamese Provinces. Sandy beaches form the seaboard of these, with sand bars at the mouths of the streams, and with patches of mangrove in the narrow marshes and pools between the more recent of the old sea beaches. The Champoon River, however, partaking of the rainfall as well as of the character of these rivers on the West side, is surrounded at the mouth by great mud-banks, large mangrove swamps and tracts of rich alluvial soil. On the West coast these evidences of deposition are extremely extensive, for the islands lend a calm to the water round the mouths of the rivers favourable to the settling of suspended matter, and the mangrove trees stepping further and further into the water as subsidence goes on highly favour further deposition among the roots; so that deposition and extension of the mangrove swamps proceed *pari passu*. Knowing somewhat of the drainage area of a river one may roughly guess, from the extent of mangrove swamp surrounding its mouth, the rainfall of the district.

Lately, at the mouth of the Krat River, on the eastern shore of the Gulf of Siam, I came across some remarkable evidence of the rate of deposition. The Krat River, rising at the western side of the Battambong Hills, drains an area of some 250 square miles, with a rainfall of probably 200 inches per annum, and runs through a clay country, a considerable extent of which is cultivated, so that it carries a great deal of matter in suspension. In 1859 H. M. *Saracen* laid down the islands at the mouth of this river showing wide channels between them and the mainland. Now those islands are almost in contact with the mainland; roughly guessing I should say some 500 acres have come above high-water mark since then.

Meteorological.

The main range of hills, although only 1,600 feet in height, determines the rainy season on the West side with the S.W. Monsoon, while in these four provinces on the East side with the N.E. Monsoon. But with the exception of some heavy downfalls in November and December, there is little of a rainy season, rain falling more or less all the year through.

Rainfall at Paron, Bangtaphan, for 1890.

Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.5	3.1	1.5	5.7	4.5	1.2	3.5	4.6	3.4	8.2	5.2	20.6

The total rainfall for 1890 at Bangtaphan was 63 inches, but at Mergui, on the other side of the Peninsula, it was over 200 inches. The change of the Monsoon always came gradually. Towards the end of April the wind veered towards the South and kept changing, so that May was half spent before it finally settled in the S.W. So again in October; for several days it may have blown from the N.E. and again returned to the S.W., so that November had well begun before we enjoyed those steady cold breezes from the N.E. that gave a piquancy to life.

In May, the hottest month of the year, the thermometer in the shade registered on an average 84.5° at 9 a.m. and 91° at midday, while at night it never sunk below 75°. But in December, I have seen the minimum thermometer register outside 59°, and in the shade 65° at night.

The Jungle Covering.

Jungle forest sweeps evenly over the Provinces of Koowi and Bangtaphan, but is interrupted in Pateeo by a large tract of grass country—of most interesting origin—but occurs again in Champoon although of a much less primitive nature than that in the two northern provinces. Rather stunted trees, surrounded by and supporting numerous twining and climbing shrubs, cover the hills with a thick, almost impenetrable undergrowth. In the valleys, near the backbone ridge, on the other hand, grow lofty trees affording valuable timber, shading a damp green undergrowth of sapling-like shrubs. In the plain, at the foot of the smaller hills, are large tracts of bamboo forest, while the jungle extending over the plain is much the same as that occurring in the valleys. Various species of figs are extremely common, and fine gum-dammar trees occurs all over these provinces and are farmed out for their oil. The oil exudes into small wells dug out of the trunk some four feet from the ground, and the exudation is at times stimulated by setting fire to the oil in the well. It is mostly used for making torches; bast is dipped in the oil, wrapt into a banana leaf, the whole tied up with pieces of rattan constituting a torch—one of the principal articles of export.

In the month of December, the leaves begin to fall, so that by the beginning of March, just before many of the trees burst into bloom, large tracts of the drier jungle are comparatively leafless. In many of these trees this shedding of the leaf is likely due to some physiological adaptation; in others that bloom while in this leafless condition, it may be to increase the display and attractiveness or facilitate the means for fertilization; and in some possibly it may be a bequest from some distant ancestor that grew in a temperate climate.

Competition for life is keen in the jungle, and although I have no statistics to offer, I believe there is a high rate of mortality amongst the jungle trees. Tottering trees infested with white ants abound, the fig trees are everywhere making victims, and after a slight gale many trunks lie prone with tons of soil upturned with their roots. When the trunk has rotted away, this soil remains as if it were a broken piece of an earth-dyke by the side of a shallow trench—very puzzling until one knows their origin. In time the rain blots them out, but from their abundance one can see that this is one of nature's methods of ploughing the jungle ground and must play not an unimportant part among the more important factors in altering the face of the land.

The sappan-wood tree is abundant, so are many species of rattan, but these with the dammar oil are the only jungle products exported from those provinces.

The Grass Country of Pateeo.

The jungle suddenly ceases at Bangtaphannoi, and from there southwards to beyond the village of Pateeo where the jungle again appears in patches, stretches an undulating country waving with lalang grass some sixty square miles in extent. Some twenty-seven years ago, so the people say—people that saw what they tell—a great typhoon crossed the Peninsula here, levelling nearly every tree as it came and included villages in the ruin, so that not a few human lives were lost. A fire following completed the work and left an open, blackened country that speedily became covered with grass that took the place of the former thick jungle forest. Here and there still stand charred stumps, while heaps of ashes covered with grass and half buried fallen boles of trees through which one's foot sinks when walking, abound everywhere. Towards the confines of this open country, the hills have their slopes facing the S.W., denuded of jungle and grass-covered, while their slopes towards the N.E. still retain their thick covering of trees. Every year the grass is set on fire and burns its border line a little further into the jungle, so that steadily it increases. The edge of the jungle, like the border of an unhealthy wound, shows no robustness nor vitality, and falls an easy pray to the all-devouring annual flames.

The result of the action of these warring elements has been to totally alter the climatic conditions, the fauna and the flora of this small locality. A few species of grass have supplanted the numerous forms of jungle growth; the small barking deer and the black leopard abound on it, with a few wild buffaloes. But there is not a human habitation upon it, notwithstanding the abundant pasture, for the Siamese keep cattle only as a means of transport and labour.

Old Paddy Fields.

With the exception of the grass country of Pateeo all the other open spaces in the jungle, which although numerous seldom exceed forty acres in extent, are old paddy-fields cleared at one time for cultivation by man. When a piece of jungle has been cleared for hill-paddy and the crop reaped and carried away, the old tree stumps sprout, young saplings spring up, and the jungle soon regains its own ; but in the low-lying level alluvial ground prepared for 'wet' paddy, and which is usually put under a course of crops, thick grass springs up, and being set on fire every dry season drives the jungle quite as far back as it is able to regain during the rains, so that it becomes a permanent opening in the jungle.

The Rice Crop.

Although small patches of tobacco are grown, and one may see cotton trees, plantains, coco-nut and betel-nut palms in gardens surrounding the houses, yet rice is by far the chief crop of those four provinces. The rice-fields lie upon the flat, alluvial soil surrounding the villages, which are invariably situated upon the banks of a stream towards its mouth. In the end of July, low earthen walls are thrown up, dividing this land into plots containing about one square rood, and the soil turned over by means of a rude wooden plough. As soon as rain falls buffaloes are turned out to trample and soften the soil and to further prepare it for sowing, they are yoked to a log of wood set with wooden teeth and the ground thus harrowed. A small seed bed is prepared, and rice sown extremely thickly, and when the crowded plants have got their heads some six inches above the ground they are transplanted and set one by one some eight inches apart in the plots already prepared by ploughing and harrowing. By the end of November, the crop is ripe, the heads are cut and gathered by the sickle, and the grain trampled out on the threshing-floor by buffaloes. The paddy is stored away in small raised bamboo houses specially made for the purpose.

An extremely small proportion of the land is under cultivation—less than 2%. Those four provinces include 2,200 square miles of the King of Siam's kingdom, and out of these 2,200 square miles about 3¾ square miles only are under cultivation. An average crop produces about 1,000 lbs. of clean rice, so that in an average year the total production in these provinces would be about 2,300,000 lbs of rice. This has to feed a population of some 16,500 souls—rather less than one half pound per head per diem—for as far as I know, there is neither export nor import in this commodity. A man and his wife could with ease cultivate four acres of rice and produce 4,000 lbs of rice, but nearly everyone grows his own supply only, and very few cultivate that amount.

From passing through those provinces and residing in them, I believe their size, acreage under cultivation, and population are approximately what I here tabulate :—

Province.	*Total square mileage.*	*Acres cultivated.*	*Population.*
Champoon, ...	740	800	6,000
Pateeo, ...	450	500	3,000
Bangtaphan, ...	480	300	2,500
Koowi, ...	560	700	5,000

Fishing Industry.

In the dietary of the Siamese, fish occupies almost as important a place as rice, and although every Siamese is partly an agriculturist, yet there are many that devote their lives entirely to either calling. All the villages have easy access to the sea; along the shore are many small collections of fishermen's houses, and here and there are Chinese *kongsis,* from all of which at the break of day boats issue to prosecute the fishing close inshore. They use nets of every shape and size almost entirely, and return about 10 o'clock, commonly with good catches, which they dispose of at something like three cents per lb., and what is not bought for immediate consumption is salted and dried in the sun. The Chinamen living in those *kongsis* on the beach are engaged in catching prawns, which they do by dredging a very fine meshed net along the sands, for the production of "blachang." At night, too, one can see torches flitting about on the water, the fisherman spearing the fish that are attracted to the light. In the streams one comes across dams in which are set all sorts of ingenious bamboo traps for fish.

Means of Communication.

The sea is the highway between these provincial towns and Bangkok the capital. Some twenty years ago Chinese junks and large boats of Siamese build crowded the Menam at Bangkok bringing in the produce from the coasts all round the gulf and carrying back products of civilization in return, but now, although two or three are always riding at anchor in the river at every village and town, they have been almost completely supplanted by small steamers flying at their stern the white elephant, having long since passed that condition of evidence required to carry the Union Jack.

On land, the towns and villages lying along the coast are connected by a path often winding along the beach, always rough and uneven, wending its way across morasses and soft miry paddy-fields, full of holes, crossing streams with neither bridge nor ford, so that it is laborious travelling indeed, and in the three southern Provinces fit for elephants only. Elephants abound in these Provinces and are used for transport, but in Koowi, where an elephant cannot be found, the roads are much better, being well adapted for buffalo drays, which are the sole means of transport.

Four years ago a telegraph line from Bangkok was carried through these provinces, and a station was opened at Bangtaphan, but so frequently was the wire broken and instruments out of order, that it was seldom of any practical use. Already there is scarcely a sound pole, and certainly not a perpendicular one, and in many places the wire has forsaken the insulators and takes its support directly from the ground.

Location of Towns and Villages.

Dacoity, or rather midnight robbery, is so rife in the district that the people, afraid to live in isolated and remote houses, congregate in towns and villages. These, surrounded by their paddy-fields, are situated upon the banks of a stream just so far from the mouth as a junk or big Siamese boat can reach at high water. In a small stream as that of Krat, the village is but a quarter of a mile from the sea; Bangtaphan, which stands upon a much larger stream, is two miles up the river, while Champoon, upon a much larger stream still, is nearly ten miles from the sea. The town occupying such a situation has the advantages of an ample supply of fresh water except at full tide, easy access to the sea for trade and fishing, and still in the midst of its paddy-fields. At the mouth of the river is commonly a small fishing hamlet known as the *Paknam,* but which as in Taiyang, at the mouth of the Champoon River, may wax bigger than the principal town situated higher up the river. The village of Paron upon the concession of "The Gold Fields of Siam Company," is a product of the mining industry there and is the only exception I know of in these provinces to the general situation upon the flat alluvial soil near the mouth of a river.

Composition of a Village or Town.

These villages or towns resemble each other as much as peas do; they agree in being an irregular row of bamboo houses covered with attaps, raised upon posts some five feet above the ground and usually about one hundred of them huddled upon one or both banks of the stream. Gardens surround the houses usually containing chilies, papaya trees, cotton plants, and other vegetables, while round about are numerous groves of coco-nut and betel-net palms, plantains and jack fruit trees. A house rather larger than the others, but quite as dilapidated, proclaims the residence of the Governor, and an open shed near his Excellency's house serves as a court of justice by day and a *sala* or rest-house by night. At a little distance from the village, commonly in the healthiest and prettiest situation, always shaded by trees, stands the *wat* or pagoda, the centre of education and religion and which shelters a yellow-robed priest to every forty inhabitants in the town. Five or six houses of rather large dimensions, but, unlike all the other houses, not raised on posts, with numerous pigs feeding in front of them and with the doors pasted over with red posters, are the shops of the village, invariably owned and conducted by the Chinese. Here are sold dyes and calico prints, Manchester and Birmingham goods of very inferior quality, while buffalo hides and horns, dried fish, coco-nuts and betel-nuts are bought or exchanged. The opium farm, the gambling farm, and the spirit farm are always in the hands of the Chinese, and while waiting sometimes in the "grog-shop" I have been surprised to see men and women come straggling in, tendering their two cents and tossing off their *arrack* much as one sees in England.

The Inhabitants.

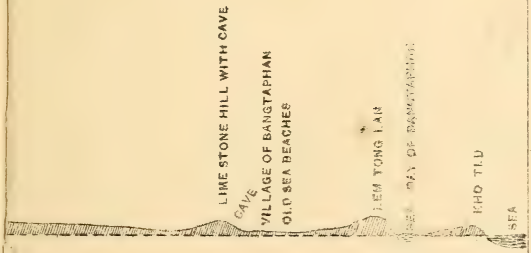
Settling down at one of those villages, and taking a random hundred of the inhabitants, one would find them something like this:—6 Chinamen wedded to 6 Siamese women and having 13 children between them; 16 would be found Siamese-Chinese of a former generation. Of pure Siamese 10 men have wedded 10 Siamese women and 18 children have been the outcome, while 11 would be unmarried Siamese—male and female. Forty-one per cent. is a low estimate of the proportion of Chinese and Chinese descendants that still wear a queue, for in some towns such as Taiyong they constitute more than 70% of the population. Into the numerous villages lying along the 3,oco miles of coast between

Rangoon and Tonquin, Chinamen have been continually dropping for centuries, mixing and marrying with the natives, so that the wonder is not that they have affected the race along the shore, but that they have not affected it more. The children of a Chinese-Siamese marriage—unlike the weaklings produced by such a wide divergence as the Siamese and European—are robust, of larger stature, and more muscular than the native, comparatively dark in complexion, and wanting the business smartness and mental activity of the father, as well as lacking that peculiar mental subtlety commonly found in the Siamese. Very curious to state, while the female offspring of a Chinese-Burmese marriage is as a rule of very prepossessing appearance, yet her Siamese cousin is invariably very ugly. The Chinese-Siamese is often a man of great ability, as can be seen by the large numbers that have raised themselves to affluence by trade, and in the last century, when the Burmese had overrun Siam and were grinding her down, one PHAYA FAK (a Chinese-Siamese) arose, rallied his countrymen round him, led them from victory to victory, until Siam was again free. Those that know the dallying nature of the Siamese must recognize the Herculean task this man performed.

Each of these provinces has its Governor appointed by the King, that of Champoon occupying the highest rank, but without exception they are greedy, ignorant, narrow-minded men, who hate the foreigner, his trade and his habits. They form a marked contrast to the discreet Chinamen that preside over the destinies of the provinces lying South of these, who in every way offer inducements to the capitalist to invest and open out the resources of the country, either agricultural or mining. But these old Siamese Governors are conservative of all their rights, and desire nothing more urgently than to keep the bustle and activity of civilization as far away as possible, and to be allowed to tread their own way, and I, for one, do not blame them.

What the future of those provinces may be, I cannot say; no doubt they contain much latent mineral and agricultural wealth, but as long as the Siamese labourer can gain his pound of rice for 2½ cents and his pound of fish at the same rate, he will wait a long time ere he will sweat himself to uncover their wealth. Besides the struggle of the native of these provinces is not for bread, it is for health, the high mortality leaving those that survive room enough and to spare to make an ample living.

IAMESE PROVINCES
TEEO & CHAMPOON


LIME STONE HILL WITH CAVE
CAVE
VILLAGE OF BANGTAPHAN
OLD SEA BEACHES
LEM TONG LAN
BAY OF BANGTAPHAN
KHO TLD
SEA

0 ft. to inch
0 ft. to inch

tion across Bangtaphan Province

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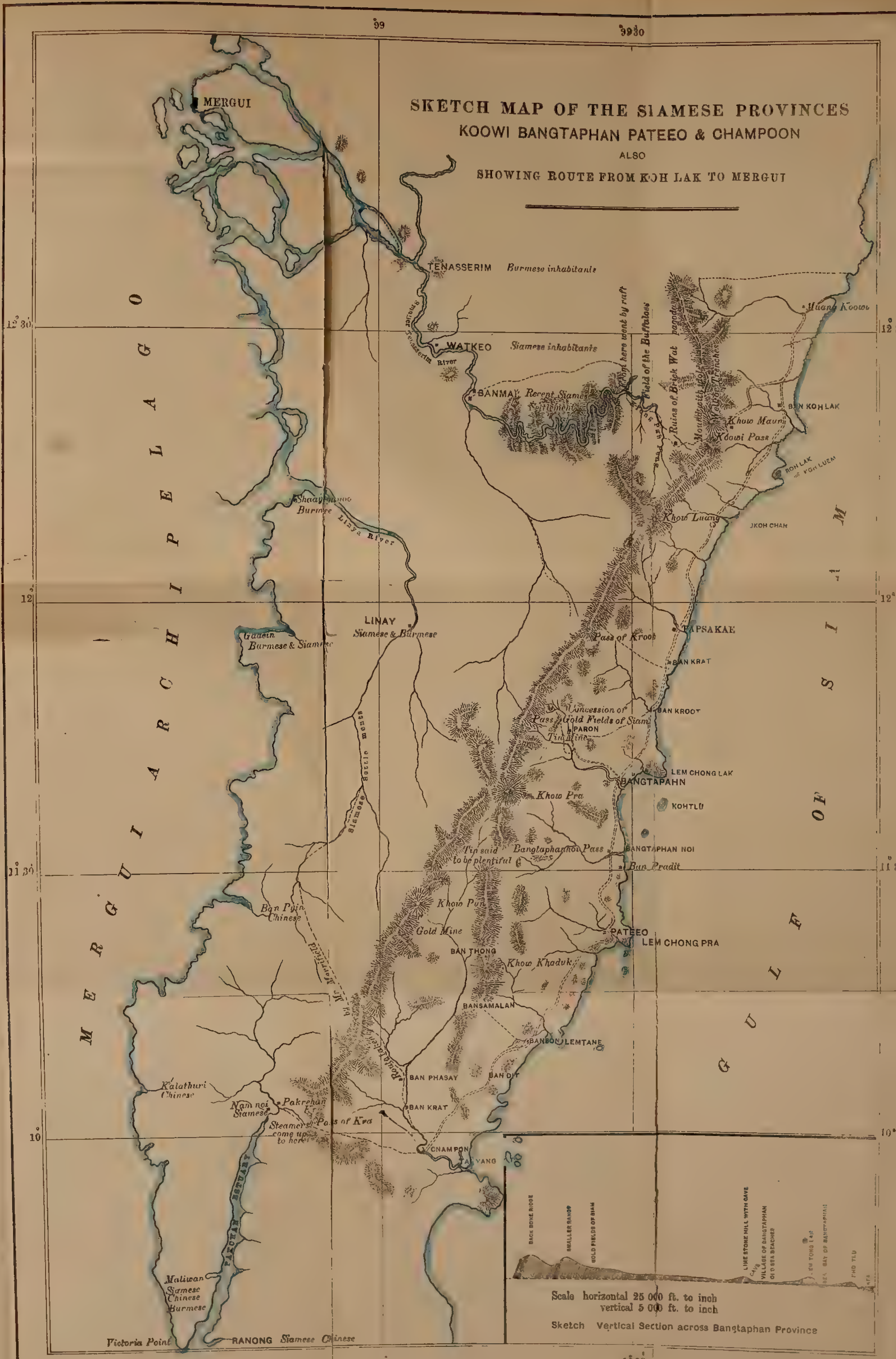

SKETCH MAP OF THE SIAMESE PROVINCES
KOOWI BANGTAPHAN PATEEO & CHAMPOON
ALSO
SHOWING ROUTE FROM KOH LAK TO MERGUI

99
99 30
12 30
12°
11 30
10°
MERGUI
TENASSERIM
Burmese inhabitants
Smaller Tenasserim River
WATKEO
Siamese inhabitants
BANMAI
Recent Siamese Settlement
Brought here went by raft
Field of the Buffaloes
Ruins of Brick Wat pagoda
Mount with idol
Wells or Trenches
Elephant Pass
Muang Koowi
BAN KOH LAK
Khow Maun
Koowi Pass
KOH LAK
KOH LUEM
Khow Luang
JKOH CHAN
Shaaymanoo
Burmese
Linya River
LINAY
Siamese & Burmese
Gadein
Burmese & Siamese
Pass of Kroot
TAPSAKAE
BAN KRAT
Concession of Gold Fields of Siam
Pass
PARON
Tin Mine
BAN KROOT
LEM CHONG LAK
BANGTAPAHN
KOHTLU
Siamese Bottle mouths
Khow Pra
Tin said to be plentiful
Bangtaphannoi Pass
BANGTAPHAN NOI
Ban Pradit
Ban Pyin
Chinese
Khow Pun
Gold Mine
PATEEO
LEM CHONG PRA
BAN THONG
Khow Khaduk
By Mr Merrifield
BANSAMALAN
Route taken
BANSON
LEMTANE
BAN PHASAY
BAN DIT
BAN KRAT
Kalathuri
Chinese
Nam noi
Siamese
Pakrehan
Kra
Pass of Kra
Steamers come up to here
CHAMPON
TA YANG
PAKCHAN ESTUARY
Maliwan
Siamese
Chinese
Burmese
Victoria Point
RANONG
Siamese Chinese
MERGUI ARCHIPELAGO
GULF OF SIAM
BACK BONE RIDGE
SMALLER RANGE
GOLD FIELDS OF SIAM
LIME STONE HILL WITH CAVE
CAVE
VILLAGE OF BANGTAPHAN
OLD SEA BEACHES
LEM TONG LAK
SEA
BAY OF BANGTAPHAN
KHO TLU
SEA

Scale horizontal 25 000 ft. to inch
vertical 5 000 ft. to inch

Sketch Vertical Section across Bangtaphan Province

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THE ALLEGED DISCOVERY OF MERCURY IN MALACCA.

BY

DR. W. BOTT, F.C.S. F.G.C.S., F.P.S., &C.

IN November last year, I was informed that a quantity of mercury had been discovered during excavations on St. Paul's Hill, Malacca, on the site of the new water reservoir for the town. The discovery, I believe, produced some little excitement at the time, and may, in certain quarters, even have conjured up pleasant visions of a new-born revenue of Malacca from a rich mercury mine. Now the existence of such a treasure would doubtless have resulted in a transfer of the proposed reservoir to a new place and the giving up of the venerable hill of St. Paul to the rude attacks of the pick and spade of the miner, and, as the work of excavation was then progressing, and the very spot of the discovery was about to be covered up, it seemed desirable to enquire into the matter without delay. In due course, I received two large bags of the supposed ore—one from the exact place where the mercury had been collected, the other from the immediate vicinity. Both samples consisted of bright red earth, and the colour might or might not have been due to cinnabar (Sulphide of Mercury) as far as mere appearance went. On closer examination, visible globules of metallic mercury were found throughout the whole of the first sample, while the second contained none. Unfortunately the character of the soil in which the mercury was found, did not accord with its occurrence, for further examination shewed that the colour of the soil was entirely due to red, argillaceous ferric hydroxide, and that besides metallic mercury it contained no combined mercury, no cinnabar, or in fact a sulphide of any kind. Now the presence of mercury in such a matrix of laterite pure and simple is a mineralogical impossibility, and my first attempt to solve the problem was by sharply questioning the Laboratory Steward whether he had lately spilled any mercury about the place. This led to indignant protests and no result, and thus there was left but one possible hope of explanation, viz., the existence of a cinnabar vein in St. Paul's Hill, from which the mercury had been derived, although it seemed strange that none of the cinnabar had found its way into the sample with it. A report was sent to the effect that the mercury was there, that it had no business to be there, and its presence could only be accounted for by a somewhat improbable hypothesis. At the instance of the Acting Resident Councillor, I was then asked to visit the place in person, but was unable to do so until the end of January, when I found a great part of the site covered up with brickwork. No difficulty was, however, experienced in ascertaining the nature of the entire formation, and proving the absence of a cinnabar vein and of sulphides generally. The existence of metallic mercury, however, was confirmed; appreciable quantities of it were found in several places, in fact 2 oz. were collected in about ten minutes. Having proved that this metal could not primarily have been present in the soil, it follows that it must have found its way into it by accident, and this opens up an unlimited field for speculation, unfortunately, however, without the redeeming feature of being able to tell the correct guess from the rest.

As several pounds of the metal had been obtained with little trouble in one place, and more might have been collected in other parts, it is evident, that a considerable quantity of mercury must, at one time or another, have been placed into the ground intentionally or accidentally; this suggests the following possibilities and new questions:—

1. The metal was intentionally poured into the ground. It is hard to conceive a reason for this; "salting" mercury mines would be a new idea entirely.

2. The metal was hidden in the ground. This is possible, and may have been done for an unlimited number of reasons, but then suitable vessels would have been used, and no trace of such has been unearthed.

3. The mercury was spilled by accident. This too is possible; it must have been a pretty big and expensive spill, and the operator does not seem to have tried very hard to pick up the precious fluid.

4. Who buried or spilled the mercury? There is no record of mercury being stored on St. Paul's Hill during recent years; the Dutch or Portuguese may, therefore, have been the guilty party.

5. What was the mercury intended for? Gold-mining?

6. Why was it buried in the ground if we discard the spilling theory?

The above and a legion more questions and conjectures environ the mercurial puzzle of St. Paul's Hill, Malacca. Whether any light will ever be thrown upon the dark problem of the bright metal, whether one of the many contributors of this Journal familiar with side issues and odd details of Malacca history will be able to produce facts bearing upon the matter, remains to be seen. Until then, to Malacca will belong the credit of an inexplicable conjuring trick in the mineral line, unless the reader traces the mercury back to spiritualistic agencies, or concludes, with TOPSY, that it "growed."

W. BOTT.

NOTE.—Since writing the above I have found the possible explanation of the discovery of mercury in St. Paul's Hill. CAMERON in his book "Malayan India," chapter XIII, states, that about 1864 Captain PLAYFAIR discovered at the base of the hill an old cellar or store-room which had formed part of the old Portuguese Government buildings. In it—in a small recess—were found forty or fifty earthenware pots mostly crumbled to pieces, but each of those which were whole contained a small quantity of mercury. Only about four pounds altogether were collected, but had the pots been full, as they probably were when first stowed away, they must have contained more than a ton of mercury. The metal had been brought there in connection with gold-mining on Mount Ophir. As only a small quantity of the metal was recovered in 1864 and recently, a ton or so of the metal, representing a value of about $2,000 would still remain buried in St. Paul's Hill. It remains, however, still to be proved that the mercury recently found *is* part of that formerly discovered by PLAYFAIR. The latter distinctly states that the mercury was discovered at the base of the hill, whereas the recent finds were made some distance above the base. It is difficult to conceive that this mercury should have worked its way up the hill, and it is more likely to be traced to another hiding place or store-room made on a higher level.

W. BOTT.

A NOTE ON RENGAS POISONING.

BY

W. C. BROWN, M.D.

THE commonest of the various species of Rengas is *Melanorrhœa Curtisii Oliv,* a tall and handsomely foliaged jungle tree which flourishes luxuriantly on many of the hill slopes of the Malay Peninsula, and extends northwards as far as the Southern Provinces of Burma. All the trees of this family contain in abundance an acrid sap, which is well known to native woodmen as a substance that, coming in contact with the skin, produces disagreeable and even dangerous results.

If the healthy skin is rubbed lightly with the juice from a freshly cut twig, violent inflammation, with smarting and burning pain, follows within twenty-four hours, and results in a characteristic pustular eruption—an eruption of blebs filled with matter. If the injured surface be of any extent, fever and other constitutional disturbances follow the local injury. When a large extent of skin has been affected, as happens when a native with unprotected body struggles through broken branches, this fever is said to be so irritant and septic that it not infrequently ends fatally. I have not, however, seen a case of such gravity, but from the peculiarly severe symptoms produced by the sap on a small surface there can be little doubt but that where a large extent of skin is involved, the consequences might be most serious. An extract or tincture of the twigs made by soaking them in proof spirit has active blistering properties, and might be of value in medicine as a counter-irritant, did we not possess in croton oil and tartarated antimony remedies whose action in producing a pustular eruption is identical with Rengas sap, and which have the additional advantage that their constitutional action is never dangerous. Internally, the juice acts as a violent irritant, causing vomiting and purging, and its administration is in the highest degree dangerous.

Malays assert that simple contact with the leaves or unbroken branches is sufficient to give rise to equally evil effects, but experiment points to the fact that it is the sap of the tree that possesses the noxious qualities, and that simple contact with unbroken twigs is not usually hurtful. It is a matter of some importance, however, to note that the wood of the Rengas tree, which, being closely grained and capable of taking a high polish, would otherwise be of great value for cabinet-making, retains its irritant properties long after the sap has apparently dried. I am informed by Messrs. KNIGHT & Co. of Singapore that, after years of seasoning, when the wood is cut up it gives rise to painful and intractable eruptions on the hands and bodies of the workmen, and that, for this reason alone, its value as an economic wood is seriously impaired.

The immediate treatment of the poison is generally successful; it should be to wrap the injured part in bandages with some dry alkaline powder, such as bicarbonate of soda, the object being to counteract the acid of the poison, and to absorb the exuded secretion from the skin. Vaseline or lard smeared on the hands and bodies of the woodcutters prevents the sap from setting up inflammation by affording a protective covering to the skin. Many cases, however, especially those that have been neglected, are refractory to treatment of any sort, and the ulcers that form between the fingers and toes as a result of Rengas poison are extremely untractable and sluggish in taking on a healthy and healing action; the eruption in emaciated and unhealthy subjects being very apt to develop into a condition of chronic ulceration.

If we pass from the region of observed fact to the more dubious realm of Malay belief and narrative, we are told that when a Rengas tree is felled, the exhalations from the cut stem are so noxious that on the woodmen inhaling them, their faces become swollen as if they had been stung by hornets, and that, although none of the sap has touched the skin, fever and blindness are usual consequences. It is impossible to accept these statements, but it is quite possible that some inflammation of the outer membrane of the eyes might be caused by the irritating vapour of Rengas sap.

With such distinctive characteristics as these, it is not surprising to find that Malays have invested the Rengas tree with supernatural properties. Before they venture to fell the tree to obtain the highly prized *tiangs* of this wood, elaborate exorcisms have to be undertaken to counteract the influences of evil-disposed *djins* and *langsuyar*. It is a matter of popular belief that, if the incantations are efficiently performed, the woodcutter is rendered proof against the poison of the sap; and three Malays living at Ayer Etam in Penang are believed to be such adepts in the art that their bodies have become impervious to the influence of the juice. I have experienced great difficulty in getting other natives to collect branches, as they insist that it is essential to have some one to do it who thoroughly understands the spells proper for the occasion. On investigation, it was found that all that these Malays claimed to achieve by their incantations was to attain exemption from the effects of the noxious vapour of the cut trees, and that they are careful to augment the protective powers of their spells by rubbing their hands and bodies with coco-nut oil.

The various species of the Rengas family must be frequently met with in the Peninsula in clearing jungle for plantations or railways, and it is obviously a matter of importance to be able to indentify trees that may expose workmen to serious danger.

Penang, 29th October, 1891.

A
NEW COLLECTION
OF
MALAY PROVERBS.

—:o:—

MANY of the following Proverbs have been known to me for a considerable period, but though familiar with their use in colloquial Malay, I never reduced them to writing until lately when, travelling in the interior of Pahang, I was driven to do so for the sake of the occupation. At the same time I considerably enlarged my original stock of hitherto unpublished Proverbs, and, to the best of my belief, the present collection contains no Proverb which has already appeared in print.

The Malay language is one which lends itself to that terseness of expression and felicity of diction which is so essential to an aphorism, and which is often the despair of the translator, who attempts to compress the meaning conveyed by a few pithy Malay words, into as many lines of English. The Malay Proverb is also interesting from a philological point of view, because in these old-time sayings many words are found which do not occur in any Malay writings, though such terms are, for the most part, common enough in the colloquial dialects.

By the Malay, who is conservative to the backbone, and a *laudator temporis acti* by nature and education, all the wisdom of the ancients (*per-kata-an orang tua-tua*) whether preserved in Proverb, Charm, or Precept, is accepted with perfect faith as incontrovertible truth. As a race, too, the Malays delight in obscure hints and darksome metaphors. An educated Malay will ask for his neighbour's daughter in marriage to his son in a letter which is simply a string of *doubles entendres*, and in familiar colloquial discourse a native will quote the first line of a verse (which in its entirety contains four lines, the first two of which are wholly irrelevant and are only introduced for the sake of rhyming with the two last lines), leaving his bewildered hearer to infer his meaning from a knowledge of the lines which form the rest of the verse, the first line of which has been given. In discussions among Malays, too, it is the man who can quote, and not he who can reason, that bears away the palm. I need hardly add that a Proverb which is both ancient and obscurely metaphorical, is immensely popular with all classes of Malays.

In preparing these Proverbs for the press, I have endeavoured to combine, as far as possible, an absolutely literal translation with a correct rendering into English of the Malay meaning.

The Proverbs are arranged in order according to the sequence of the Malay alphabet.

HUGH CLIFFORD.

1 اداكه هيلڠ بيسا اولر مڽوسڤ دباوه اكر

Ada-kah hilang bisa ular meny-usop di-bawah akar.

Will a snake lose its venom through creeping under a root? *i., e.,* will a Chief lose his rank through being civil to his inferiors?

---

2 اصل اڠكو توݢل اداله بنيس

Asal angkau tugal ada-lah benis.

If you make holes in the ground, seed shall be forthcoming. Used to signify that if an offence is committed retaliation will follow.

Tugal توݢل = the holes in the ground prepared for the reception of seed; to sew seed in holes prepared for it; to make holes in the ground for the reception of seed.

FAVRE renders this word "*Culture du riz dans des terres élevées et sèches,*" but omits to mention the particular manner of planting to which alone this word (so far as my experience goes) is applied.

---

3 اڠݢوق بوكن ݢيليڠ يا

Anggok bukan géling ya.

Not a nod but a shake of the head.

To feign a desire for one thing while really desiring something different.

---

4 انتن فاته لسوڠ تاٴ بربوڽي

Antan patah lesong hilang.

If the pestle be broken, the mortar will be lost.

If the husband be impotent, the wife will prove unfaithful.

5 انجيغ گالق بابي براني

Anjing galak babi brani.

The dogs are ferocious and the pigs are daring

Used to signify that both sides are 'spoiling for a fight.'

---

6 انق بايق منتو موليق

Anak baik menantu molek.

A good son and a pretty daughter-in-law.

Used in speaking of people who are entirely of one mind.

---

7 اولر بوکن ايکن فون بوکن

Ular bukan ikan pun bukan.

Neither snake nor fish.

'Neither fish, flesh, nor fowl, nor good red-herring.'

---

8 ايکن بيار دافت سرمفغ جاڠن فوکه

Ikan biar dapat serampang jangan pokah.

Let the fish be caught, but let not the fish spear be bent.

To act with due discretion.

Compare Prov. 27 in No. 11 of this Journal, and the two Proverbs with which Mr. MAXWELL there compares it. The familiar version of Prov. 27 with which I am best acquainted, runs as follows :—

اولر بير ماتي تانه جاڠن لکوق بولوه جاڠن فاته

Ular biar mati tanah jangan lekok buloh jangan patah.

Let the snake die, but let not the ground be dented, nor the bamboo broken.

Pokah فوکه = to bend ; to become bent ; to be bent ; to be out of the straight; bent; crooked.

This term, though a common colloquial expression, is not, I believe, to be found in any Malay Dictionary now published.

9 ايكن تركيرف جال تيب

Ikan ter-kirap jala tiba.

As the fish shake themselves clear, the casting net arrives.

Too late.

10 باتو كچيل برگوليغ نايك باتو بسر برگوليغ تورن

Batu kechil ber-guling naik, batu besar ber-guling turun.

Little stones roll up, and big stones roll down.

The end of all things, when the common people shall be greater than the nobles.

11 باتو هيتم تاء برسنديغ

Batu hitam ta' ber-sanding.

A black stone without projections.

Difficult to injure.

12 باغو٢ منتاء اكو لهير بادق٢ منتا اكو داگيغ

Bangau! Bangau! minta aku lehir. Badak! Badak! minta aku daging.

Oh stork! I beg from thee thy neck! Oh rhinoceros! I beg from thee thy flesh!

Compare:—

Prov. 64 of Mr. MAXWELL'S collection published in No. 2 of this Journal.

دمنتاْ كفد يڠاد

Di-minta ka-pada iang ada.

Ask from those who possess, &c.

---

13 باڬي انجيڠ ترسفيت دفاڬر

Bagai anjing ter-sepit di-pagar.

Like a dog squeezed in a fence.

Viz., Making a hideous clamour.

The form :—

باڬي انجيڠ ترسفيت ايكور

Bagai anjing ter-sepit ekor.

Like a dog when its tail is squeezed.
And also met with.

---

14 باڬي انجيڠ ملنتڠ دني

Bagai anjing me-lentang denai.

Like a dog hunting wide.

(*Lit.*, crossing a jungle path.)

Denai دني = a small foot-path in deep jungle. This word, though often met with in colloquial Malay, is not to be found in any Dictionary.

---

15 باڬي انجيڠ مڽالق دفنتت ڬاجه

Bagai anjing meny-alak di-pantat gajah.

Like a dog barking at an elephant's stern.

Impotent rage.

16 باگي انق دارا مابق اندم

Bagai anak dara mabok andam.

Like a maiden overcome by the fringe upon her forehead.

Self-conscious; shy.

Andam اندم = the fringe of short hair cut upon the forehead of newly married girls, or girls who are about to be married. FAVRE mistranslates this word—'Arranged, adjusted, &c.'

---

17 باگي اور گنتوڠ كتبيڠ باگي تبيڠ گنتوڠ كاْور

Bagai aur gantong ka-tebing, bagai tebing gantong ka-aur.

Like a bamboo hanging from a river bank, and like a river bank depending from a bamboo.

To lean on a broken reed.

---

18 باگي اير تيتيق كباتو

Bagai ayer titek ka-batu.

Like water dripping on to a stone.

---

19 باگي ايكن كنا توب

Bagai ikan kena tuba.

Like a fish poisoned by the *tuba* (*Derris elliptica*) root.

In difficulties. 'Up a tree.'

The above Proverb is generally used with several others:—

باگي ايكن كنا توب اودڠ ددالم تڠگوق
باگي اولر نڠكا ترهمڤس كباتو
باگي روان ددالم توار

باڬي انق سڤت كتهور
باڬي دكن دباوه ڤڠكل بوله

Bagai ikan kena tuba.
Udang di-dalam tanggok.
Bagai ulat nangka ter-hempas ka-batu.
Bagai ruan di-dalam tuar.
Bagai anak sepat ka-tohor.
Bagai dekan di-bawah pangkal buloh.

Like a fish poisoned with the *tuba* root.
Like a prawn in a prawn-basket.
Like jack-fruit grub dashed against a stone.
Like a *ruan* fish in a rattan fish-trap.
Like a little *sepat* fish in the shallows.
Like the bamboo-rat under the roots of the bamboo.

Ruan روان and *Sepat* سڤت are both small fish found in the *padi* swamps, and are usually caught by means of a *serkap*.

Tuar توار = a fish-trap of a conical shape, made from the *onak* thorn, and so constructed that a fish can enter without difficulty, but cannot get out without being hooked by the thorns.

---

20 باڬي ايم دماكن توڠو

Bagai ayam di-makan tungau.

Like a fowl devoured by parasites.

Poorly ; seedy-looking ; in poor condition.

Tungau توڠو = a small red parasite found on the sand-sprits which line the river-banks in the Peninsula. It breeds in the dung of buffaloes.

21 باڬي بودق سافو هيڠوس

Bagai budak sapu hingus.

Like a child which has its nose wiped for it,
A muff.

---

22 باگي تاگر دفولو سمبيلن

Bagai tagar di-pulau sembilan.

Like a thunder-clap at Pulau Sembilan.

Used to describe a very loud noise.

This Proverb is in use in Perak. The place mentioned is a group of islands at the mouth of the Perak River.

---

23 باگي تومن ماكن انق

Bagai toman makan anak.

Like the *toman* fish which eats its own young.

Applied to Chiefs who misuse their powers, oppressing those whom they are bound to protect.

Toman تومن = a fresh water fish which attains a considerable size. Its colour is a reddish yellow, and its flesh is of a saffron hue. It subsists on other fish.

---

24 باڬي رابق دڠن افي اصل بردكت مڽالاله اي

Bagai rabok dengan api asal ber-dekat me-nyala-lah ia.

Like tinder and fire, which if they come near one another burst into a blaze.

Applied to people who are deadly enemies.

---

25 باگي فلندق ددالم چراغ

Bagai pelandok di-dalam cherang.

Like a mouse-deer in a clearing, *i. e.*, stupid, bewildered, timid.

Cherang چراڠ = a clearing; an opening in the forest made for planting purposes. This word is much used in the States on the Eastern slope of the Peninsula. It is probably derived from *Trang* تراڠ light, open, clear, &c. The form *chĕ-rakn* (a clearing) met with in the Sĕn-oi dialect of Sakai, has the appearance of being formed from the Malay word and not *vice versâ*.

26 باگي كرا دافت چڠگوڠ

Bagai kra dapat changgong.

Like an ape which has caught hold of a snag.
Clinging like grim death; as a fool clings to bad advice.

27 باگي كليف٢ تربڠ مالم

Bagai klip-klip terbang malam.

Like a fire-fly flying by night. Said of a supposed secret which is widely known.

Compare:—

ايم فوتيه تربڠ مالم

Ayam puteh terbang malam.

A white fowl flying by night, in Mr. MAXWELL'S collection of Malay Proverbs.

28 باگي كوچيڠ دڠن فڠگڠ

Bagai kuching dengan panggang.

Like the cat with the roast.
Impossible to keep apart. Said of the mutual attraction between young people of opposite sexes.

29 باگي گاله دتڠه اروس

Bagai galah di-tengah arus.

Like a boat-pole in mid-stream, *i. e.*, shaking from head to foot.

---

30 باگي ماٴ مندول بهرو برانق

Bagai ma' mandul bharu ber-anak.

Like a hitherto barren woman who has just given birth to a child.

"As pleased as Punch."

Compare :—

باگي اورڠ بوت بهرو چليق،

Bagai orang buta bharu chelék.

Like a blind man who has newly recovered his sight.

---

31 باگي مناريق رمبوت ددالم تفوڠ

Bagai men-arek rambut di-dalam tepong.

Like pulling a hair out of flour.

"As easy as lying."

---

32 باگي هريمو برانق مودا

Bagai harimau ber-anak muda.

Like a tiger with young cubs.
Irritable ; angry without provocation.

---

33 بايك فوتيه تولڠ جاڠن فوتيه مات

Baik puteh tulang jangan puteh mata.

Better white bones than white eyes.

This Proverb contains an idiom; *puteh mata* (white eyes) being a common Malay expression signifying "ill-feeling," "black blood," &c. The meaning of the above Proverb thus is, that it is better that a quarrel should come to a head, even though it ends in the death of one of the parties concerned, rather than that ill-feeling should exist endlessly.

---

34 ببرافکه تاجم ڤيسو ڤارڠ تاجم لاݢي مولوت ماءنسي

Be-ber-apa-kah tajam pisau parang tajam lagi mulut manusia.

However sharp is a knife or a chopper, sharper yet is the human tongue.

---

35 بتول٢ ايكور انجيڠ كالو بݢيمان ڤون اد جوݢ بيڠكوقڽ

Betul-betul ekor anjing kalau bagai-mana pun ada juga bengkok-nya.

However straight a dog's tail may be, it will still be crooked.

A rogue will never be altogether honest.

---

36 بچاراکن رومڤت دهلامن اورڠ دهلامن سنديري رومڤت
سمڤي ككاكي تڠݢا

Bechara-kan rumput di-halaman orang di-halaman sendiri rumput sampai ka-kaki tangga.

To take thought of the grass on one's neighbour's lawn while that on one's own house-plot spreads even unto the foot of the door-step.

The beam and the mote.

---

37 ببراڤ ڤون انجيڠ مڽالق بوکيت بولهکه رونته

Be-ber-apa pun anjing meny-alak bukit bulih-kah runtoh.

However much dogs may bark, will a hill fall to pieces? *i. e.*, Does a man of assured position regard the slander of his inferiors?

---

38 برتليڠکوه انتن دلسوڠ ايم جوݢ يڠکڽڠ

Ber-telingkoh antan di-lesong ayam juga yang kennyang.

When the pestles fall together into the mortar, the fowls have their bellies-full.

When men of rank quarrel, the common people reap the benefit.

Telingkoh تليڠکوه = to collide; to clash. So far as I know this word is not to be found in any Malay Dictionary.

---

39 برچري تيدق برطلق برنيکح تيدق برقضي

Ber-cherai tidak ber-talak ber-nikah tidak ber-kathi.

Divorced without the ceremony of divorce, and married without the assistance of the clergy.

Said of the parents of a bastard.

---

40 بري بتيس هندق ڤها

Bri betis handak paha.

Give the leg and the thigh is wanted.

"Give an inch they take an ell."

Compare Proverb 99 in this collection.

---

41 بلوم توارڠ ڤنجڠ بواه سڠکواڠ سبسر بتيس

Belum tuarang panjang buah sengkuang s'besar betis.

Before a drought has lasted for a long time the *sengkuang* fruit are grown to be as big as the calf of one's leg.

Said when false reports are spread without any foundation for them.

Tuarang = a drought which is even of longer duration than the ordinary drought called *Kamarau* كمارو.

Sengkuang = the name of a creeping plant which has an edible root. The fruit is said only to grow large during very dry weather.

---

42 بيير٢ نايك كمات

Biar-biar naik ka-mata.

Intestinal worms ascend even unto the eyes.

"Do not put off till to-morrow what may be done to-day."

This Proverb contains a play upon the words *biar-biar* بيير٢ (intestinal worms), and *biar* بير (to leave alone; to let be); but it is impossible to render this pun in an English translation. This Proverb is generally used in answer to any one who says *Biar-lah dahulu* بيرله دهول "let it be for the present;" in reply to an order bidding him do anything.

---

43 تاْ بوله دبايكي جاڠن دفيچهكن

Ta' bulih di-baik-i jangan di-pichah-kan.

If you cannot mend it, do not break it more.

---

44 تاْ سوڠگه گته داون دڠن سبنر گته باتڠ جوگ

Ta' sunggoh getah daun dengan s'benar getah batang juga.

Not really resin from the leaf, but in truth resin from the trunk of the tree.

Said of one who has authority which is the result of the influence of some one greater than he, with whom he is connected.

---

45 تانه لمبه كندوڠن اير كايو بيڠكوق تيتين كرا

Tanah lembah kandong-an ayer, kayu bengkok titi-an kra.

Low-lying land holds water; a crooked bough is used by monkies as a bridge.

The rich prevail, the poor go to the wall.

---

46 تأوسهله اجر انق بواي برنڠ دي سده فندي سدي

Ta' usah-lah ajar anak buaya bernang, dia sudah pandai sedia.

It is not necessary to teach a young crocodile how to swim, as it is already expert.

"To teach one's grandmother to suck eggs."

Compare:—

ايتيق داجر برنڠ

Itek di-ajar bernang.

The duck is taught to swim.

(No. 77 of KLINKERT'S Collection of Proverbs).

---

47 تأوسه بيمبڠ گولا ددالم مولت بيل هندق تلن تلن

Ta'usah bimbang gula di-dalam mulut bila handak telan telan.

Be not solicitous concerning the sugar which is in your mouth, when you desire to swallow it, do so!

Do not be anxious about trifling undertakings.

---

48 تاهن جرت سوروڠ كفلا

Tahan jerat surong kapala.

Set a snare and thrust your head into it.

Applied to those who through excess of cunning overreach themselves.

---

49 تراس تراونجم گوبل ملايڠ
برتينتيڠ برتمفي تراس
گوبل ملايڠ تراس تيڠگل

Tras ter-unjam gubal me-layang.
Ber-tinting ber-tampi tras.
Gubal me-layang tras tinggal.

The core of the tree is fixed firmly in the ground, and the light wood which surrounds it is blown away. When the core of the tree is sifted, the light wood is blown away, but the core of the tree remains.

If common people compete with nobles, they come to an evil end, while the nobles remain unharmed.

Unjam اونجم = to stick upright in the ground. This word is exactly similar in meaning to *Chachak*, چاچق.

---

50 تركنا فد ايكن برسورق
تركنا فد باتڠ ماسم

Ter-kena pada ikan ber-sorak.
Ter-kena pada batang masam.

To shout with triumph if one strikes a fish, and to be cross if one strikes a log.

Unduly elated by success and unduly depressed by adversity.

---

51 جاڠن دسڠكاكن ايكن لايس٢ تيدق مڽڠت

Jangan di-sangka-kan ikan lais-lais tidak meny-engat.

Do not fancy that the *lais-lais* fish will not sting.

"Despise not thy enemy."

Lais-lais لايس٢ = a small fresh water fish which is armed with sharp stings in its fins.

52 جاڠن داجر انق هريمو ماكن داڬيڠ

Jangan di-ajar anak harimau makan daging.

Do not teach a tiger cub to eat flesh.

Said to those who give bad advice to a young *Raja* or Chief who unassisted will learn evil ways quite quickly enough.

53 جكلو برانق ايكوت كات بيدن

Jikalau ber-anak ikut kata bidan.

If thou art confined of a child, do as the midwife bids thee.

Follow the advice of experts.

54 چاريق٢ بولو ايم لام٢ اي برچنتوم بول

Charek-charek bulu ayam lama-lama ia ber-chantum bula.

Though a fowl's feathers may be torn to tatters they will eventually grow again thickly.

Though relatives may quarrel, they will eventually make friends again.

Chantum چنتوم is translated by FAVRE, "Piqué, piqué à l'aiguille," but that I believe to be only a secondary meaning, the term being principally used to express a thick growth of any kind.

In Pahang, *Chantum* چنتوم in this Proverb is often replaced by *Tampun* تمفون, which has the same signification as *Chan-*

tum, but is not as universally understood among the Malays of the Peninsula.

---

55 دتوب سهاجكه ايكن دجال جاريڠ بوكنكه ايكن

Di-tuba sahaja-kah ikan di-jala jaring bukan-kah ikan.

Are those alone fish which are poisoned with the *tuba* root? Are those not also fish which are caught in the nets?

Usually applied by a plain woman in the sense "are accomplishments confined to those who are well favoured?"

---

56 دسڠكاكن لاڠيت اية رنده
دفندڠ دكت دچافي تأبوله

Di-sangka-kan langit itu rendah.
Di-pandang dekat di-chapai ta' bulih.

To think that the heavens are low, but though they look as though they were close they cannot be touched with the hand.

Said of the relationship which exists between a *Raja* or Chief and his followers.

---

57 دمان تمفت كوتو هندق ماكن جكلو تيدق داتس كڤلا

Di-mana tempat kutu handak makan jikalau tidak di-atas kapala.

Where shall lice feed if not upon the head?
i. e., Where shall the poor find relief if not from the bounty of the great?

---

58 دمانكه برتراتس كايو مهڠ

Di-mana-kah ber-tras kayu mahang.

Where is there found a hard wood core in a *mahang* tree?
Do not expect impossibilities.

Mahang مهڠ = the name of a forest tree of very soft wood *(Macaranga)*. Native tradition says that the name of the State of Pahang is derived from this word. The tiny brook which debouches at Kuala Tembeling and gives its name to the great stream formed by the Jelai and Tembeling Rivers, taking its source, it is said, at a spot where a giant *mahang* tree once stood.

---

59 دمفيت تيدق برسڠگيت
دتمبت تيدق برتالي
Dempit tidak ber-sanggit.
Di-tambat tidak ber-tali.

Pressed together but not rubbing, tied without twine.

Said of persons who live together, but who are not bound by any real tie.

Sanggit شڠكيت = to rub against; to touch against anything. To come in contact, or to be in contact with anything.

The root, which is found in *Dempit* دمڤيت, is one which has retained its form and its meaning in a more marked degree than almost any other Malay root. This is exemplified by the following words:—

Apit افيت = to press, &c.

Kapit كافيت = to press, pressed, &c. (See *Pulut kapit* فولوت كافيت = pressed olenaceous rice.)

Kepit كفيت = to carry under the armpit, *viz.*, pressed between the arm and the body.

Sepit سڤيت = to squeeze, &c. (*See* Proverb 13 of this Collection.)

Hempit همڤيت = to get close to anything; to press against it, &c.

Sempit شمفيت = narrow, confined.

Sumpit سومفيت or *Kempit* كمفيت = a narrow rice bag (a place in which rice is confined).

Chubit چوبيت = to pinch.

The word *Apit* افيت has been traced to a Sanskrit root; but either the resemblance is a chance coincidence, or else this root which runs through so many common words in Malay is itself derived from Sanskrit, which would seem improbable.

60 جاڠن دسسل گونوڠ برلاري هيلڠ كابوت تمفقله دي

Jangan di-sesal gunong ber-lari, hilang kabut tampak-lah dia.

Fret not through fear that a mountain will run away, when the mist clears it will be still in view.

Do not be anxious about remote contingencies.

61 سام كاين باسه سهلي تيمه سسوكو كالو تاء تيمه فرڬي سراس مندافت

Sama kain basah s'hele timah s'suku, kalau ta' timah pergi s'rasa men-dapat.

A bathing cloth and a *suku* of money are of equal value.

If only one did not pay the money away, one would feel as though one had gained by the bargain.

Said of one who wishes to "have his cake and eat it too."

62 سفرت انجيڠ دافة فاسير

Seperti anjing dapat pasir.

Like a dog on a sand-bank.

Running heedlessly hither and thither through sheer rude health and robust spirits.

63 سفرت ددالو افي هيڠڬف كفوهن كايو
هيڠڬف كائيبو ايبوڽ ماتي
هيڠڬف كرنتيڠ رنتيڠڽ فاته

Seperti dedalu api hinggap ka-pohun kayu.
Hinggap ka-ibu ibu-nya mati.
Hinggap ka-ranting ranting-nya patah.

Like a spark of fire falling upon a tree.

If it falls upon the trunk the trunk will die.

If it falls upon a branch the branch will be broken.

"Evil communication corrupts good manners."

---

64 سفرت اورڠ ماتي جكلو تياد اورڠ مڠاڠكت بيلاكه برڬرق

Seperti orang mati jikalau tiada orang meng-angkat bila-kah ber-grak.

Like a dead man. If no one lifts him up, when will he be able to move?

Helpless. Impotent.

---

65 سفرت برڬنتوڠ فد رمبوت سهلي

Seperti ber-gantong pada rambut s'hele.

Like hanging on a single hair.

A precarious position.

---

66 سفرت تبو لفس كدالم مولت ڬاجه فايه اكن كلوارڽ

Seperti tebu lepas ka-dalam mulut gajah payah akan ka-luar-nya.

Like sugar-cane which has entered an elephant's mouth, difficult to extricate.

Applied to missed opportunities.

67 سفرة تمفت گاجه لالو

Seperti tempat gajah lalu.

Like a place through which elephants have passed.

Said of places through which a royal progress has been made.

---

68 سفرت ساگ داتس تالم

Seperti saga di-atas talam.

Like a single pea on a large tray.

Said of one who is close-fisted and inhospitable. The Barmecide's feast.

---

69 سفرة فيسو راوة بيڠكوق اورڠ بوله بتول بيڠكوق
سنديري تاٴ بوله بتول

Seperti pisau raut bengkok orang bulih betul bengkok
kita ta' bulih betul.

Like a (bent) knife used for scraping *rotan*. The twists in others can be made straight, but one's own kinks can never be straightened.

Applied to himself by one who considers that his offences are more severely punished than the offences committed by others.

"One man may steal a horse, and another may not look over the fence."

A *pisau raut* has a slightly curved blade which is about the size of an ordinary razor. This blade is attached to a handle, which is usually double or treble the length of the blade. As its name implies it is used to "scrape" *rotan,* etc.

---

70 سفرة كربو منندوق انق دڠن فافر تيدق دڠن هوجڠ

Seperti kerbau men-andok anak dengan papar tidak dengan hujong.

Like a buffalo butting its young with the flat and not with the points of the horn.

Parents' anger to their children is always tempered with love.

---

71 سڤرة كلي دوا سلوبڠ

Seperti kli dua s'lobang.

Like two *kli* fish in one hole.

Said of people who are in one mind in all their enterprises. *Kli* كلي = a long scaleless fish found in the *padi* swamps.

In Ulu Pahang the two Chiefs who live in the far *Ulu* of the Lipis District bear the titles of TO' KLI and TO' BAKAR, respectively. Neither of them has ever visited the Sultan of Pahang, which fact caused the Sultan to declare that TO' KLI was too slippery to hold, and TO' BAKAR (Bakar باكر=to burn) too hot to handle. This royal witticism is a good specimen of the Malay pun.

---

72 سڬن برتاڽ سست جالن

Segan ber-tanya sesat jalan.

If you are too shy to make enquiries, you will lose your way.

---

73 سمبليه ايم دڠن ڤيسو سمبليه اورڠ دڠن كاڤس

Sembleh ayam dengan pisau, sembleh orang dengan kapas.

Cut a fowl's throat with a knife, and a man's throat with cotton.

Men are deceived by soft words.

---

74 سوسو ددادا تاْداڤت دايلقكن

Susu di-dada ta'dapat di-elak-kan.

Milk at the breast cannot be shirked.

Responsibilities cannot be evaded.

Elak ايلق = to shirk; to avoid; to escape from. Though this word is of daily occurrence in colloquial Malay, I have not met it in any Malay Dictionary now published.

---

75 سياڤ مڠاكو بيرق دتڠه جالن

Si-apa meng-aku berak di-tengah jalan.

Who will confess to having committed a nuisance?

i. e., Who will own to a disgraceful act?

---

76 سيئكور كاتق دباوه تمفوروڠ دسڠكاكن تياد دنيا يڠلاين

S'ekor katak di-bawah tempurong di-sangka-kan tiada dunia iang lain.

A frog beneath a coco-nut shell believes that there is no other world.

Applied to those who are unduly impressed with the importance of themselves and their own immediate surrounding.

---

77 سيئكور كربو ممباواء لومفر سمواڽ ترفاليت

S'ekor kerbau mem-bawa' lumpor samoa ter-palit.

One buffalo brings mud and all the herd are smeared with it.

Evil example is quickly followed.

---

78 عبارت بورڠ ماة لفس بادنڽ تركوروڠ

Ïbarat burong, mata lepas badan-nya ter-kurong.

Like a bird whose eyes are at liberty to wander, but whose body is in confinement.

79 عبارة بورڠ مولت مانسي جاڠن دفاکي

Ibarat burong mulut manis jangan di-pakai.

The metaphor of a bird—Do not place trust in sweet words. Said of chance travellers who "love and ride away."

80 ڤادم مڽالا تاريق ڤونتوڠ

Padam me-nyala tarek puntong.

When the blaze has gone out, you can draw the logs from the fire-place.

This Proverb is used as a boast, meaning that the speaker, like Mr. AUGUSTUS MODEL, "will never be taken alive."

81 ڤاته توڠکت برجرامڠ

Patah tongkat ber-jeremang.

The staff being broken, to go supporting oneself upon all fours.

Said of one who will never give in and confess himself to be beaten.

82 ڤاته تومبه هيلڠ برݢنتي

Patah tumboh hilang ber-ganti.

That which is broken off shoots afresh. That which is lost is replaced.

All things have their compensation.

"When I have seen the hungry ocean gain
"Encroachment on the kingdom of the shore,
"And the firm ground win of the watery main
"Increasing store with loss and loss with store, &c."

83 كالو تاٴ سير بردگف سير ملايغ

Kalau ta'sir ber-degap sir me-layang.

If not head over ears in love, at least slightly smitten.

Sir سير = to care, to desire, to want, to wish for, to be anxious to obtain. To condescend to.

In his collection of Malay Proverbs (Prov. 272) printed in No. 3 of this Journal, Mr. MAXWELL gives this word as *Sior* which, however, is only the local pronunciation of the word in the Perak dialect, where a final ير *ir* is always rendered *ior* in the colloquial pronunciation, *e. g.*, *Kikir* كيكير, a file, is pronounced *Kikior* in the Perak dialect. This word is in common colloquial use in Perak, Pahang, Kelantan, Trengganu and Patani. Another word *Sualak* سوالق, which is not included in lists of words yet published, is also frequently met with in the colloquial dialects, especially in Perak. Mr. MAXWELL states that *Sir* is identical in meaning with *Ingin* ايڠين, but in the negative form *Ta' sir,* and *Ta' sualak* also, are perhaps better rendered into polite Malay by the phrase *Ta' sudi* تاٴسودي.

Degap دگف which is also a slang word not found in any Dictionary, signifies 'thoroughly, altogether,' &c. *Kena degap* كنا دڬف has much the same signification as *Kena tepat* كنا تفت to be hit full, to be hit fair.

---

84 كالو ڬاجه هندق فندڠ ڬاديڠ
كالو هريمو هندق فندڠ بلڠ

Kalau gajah handak pandang gading-nya.
Kalau harimau handak pandang blang-nya.

If an elephant, he wants to examine its tusks. If a tiger, he wants to see its stripes.

Said of one who is ready for "anything from pitch and toss to manslaughter."

Blang بلڠ has often been incorrectly translated 'piebald' whereas its true meaning is *striped,* 'piebald' being exactly rendered by the Malay work *Tompok* تومڤق. FAVRE would seem to have missed the meaning of this latter word in this connection, as he translates it 'Pile, monceau, tas, amas, 'être en pile, en groupe' and renders *pie* (piebald) by *plang* ڤلڠ, which is merely a corrupted form of *blang* بلڠ

85 كاله منڠ تاٴتاهو برسورق بوله

Kalah menang ta'tahu ber-sorak bulih.

We know not whether we shall win or lose, but anyhow we can shout !

Said by those who anticipate a victory.

86 کچيل تاٴبوله دسڠكاكن انق
بسر تاٴبوله دسڠكاكن باڤ

Kechil ta'bulih di-sangka-kan anak.
Besar ta'bulih di-sangka-kan bapa.

Small beasts should not be accounted young, nor large beasts be accounted parents.

Do not judge by appearances.

87 كسيهنكن راج داتس اوسوڠ

Kasih-an-kan raja di-atas usong.

To feel pity for a prince upon his litter.

Misplaced pity.

88 كفلا سام هيتم هاتي ماسيغ ٢

Kapala sama hitam hati masing-masing.

Our heads alike are black, but our hearts are different in each one of us.

---

89 كومبغ تاء سئيكور بوڠا تاء سكاكي

Kumbang ta' s'ekor, bunga ta' s'kaki.

There is not only one beetle, and but a single flower.

"There are as good fish in the sea as ever came out of it."

---

90 كيت بهرو چافي فغايوه اورڠ سوده تيب كسبرڠ

Kita bharu chapai peng-ayuh orang sudah tiba ka-sebrang.

We have just taken up our paddles when others have already crossed the stream.

Said of one who is too late.

"To be asked for the wedding and arrive for the christening."

---

91 كيت سموا ماتي تتافي قبور ماسيڠ٢

Kita samoa mati tetapi kubor masing-masing.

We all alike die, but our graves are separate.

Men's lots are divided.

92 كيچيق انق ملاك
بوال انق منڠكابو
تيفو انق رمبو
بيدعه انق ترڠڬانو
سومبوڠ انق فهڠ

Kéchek anak Malaka.
Bual anak Menangkabau.
Tipu anak Rembau.
Bidaäh anak Trengganu.
Sombong anak Pahang.

The men of Malacca wheedle; the men of Menangkabau draw the long bow; the men of Rembau cheat; the men of Trengganu lie; and arrogant are the men of Pahang!

The above proverbial saying hits off the most prominent characteristic of each nation of Malays mentioned.

---

93 كورڠ تنق رڠكوه يڠلبه

Kurang krat rengkoh yang lebeh.

The less we sever by cutting the more we break by pulling and twisting.

We cannot shirk our responsibilities, and if we put them aside in one form they will start up afresh in another.

Rengkoh رڠكوه=to break by pulling, twisting or bending. It has much the same meaning as that more common word *Lentor* لنتور.

---

94 گاجه هندق بيرق بسر كنچيل هندق بيرق بسر ايسق كببڠ

Gajah handak berak besar, kanchil handak berak besar esok ka-bebang.

The elephant passes huge excrement; the mouse-deer desires to do the same: in the end the latter will have a stoppage of the anus.

The frog and the bull.

Bebang ببڠ = a stoppage of the anus, or of the womb in child-birth.

95 ڬهرو دباكر كمڽن برباءُو

Gharu di-bakar kemenyan ber-bau.

Ligom aloes is burned and gum benzoin gives forth a sweet odour.

One man does the work and another reaps the benefit.

96 لمه ليت كايو اكر دلنتور بوله دفاته تاء دافت

Lemah liat kayu akar di-lentok bulih di-patah ta'dapat.

Yielding yet tough like a root which can be bent but not broken.

Said of one who knows when to resist and when to give way.

97 لار٢ ماكن داوفيه لاڬي فوتيه لاڬي دكروه

Lar-lar makan di-upih lagi puteh lagi di-kroh.

Insects eating the betel-palm sheath the whiter it grows the more turbid is the water which cleanses it.

98 ليده برچابڠ باڬي بياوق

Lidah ber-chabang bagai biawak.

A tongue forked like that of an iguana.

Said of one who breaks faith with another.

99 ماكين موره ماكين منارار

Makin murah makin men-awar.

The lower the price, the more you cheapen it.

"Give an inch you take an ell."

See Proverb 40 of this collection.

100 مالو ماكن فروة لافر

مالو بركايوه فراهو تاءلاجو

Malu makan prot lapar.

Malu ber-kayuh prau ta'laju.

If one is shy to eat, one's belly will feel hunger. If one is ashamed to paddle, one's boat will not travel swiftly.

Indolence leads to poverty.

Compare Proverbs 168 and 173 in Mr. MAXWELL'S collection published in No. 2 of this Journal.

101 مڠات دولڠ فاكو سرفيه

Meng-ata dulang paku serpih.

The chipped nail abuses the tray.

This Proverb is best explained by the line which is usually tacked on to it :—

مڠات اورڠ اوق يڠ لبه

Meng-ata orang awak yang lebeh.

When we abuse others we infer that we are better than they are.

102 منتاءداره فد دايڠ

Minta darah pada daing.

To ask a dried fish for its blood.

" You cannot get blood from a stone."

103 منمبون تانه يڠ تيڠگي مڠگالي تانه يڠ لكوق

Men-ambun tanah iang tinggi, meng-gali tanah iang lekok.

To heap up earth on a place where the ground is already high, and to dig where the earth is already indented.

Useless labour.

104 مننتي ارا تأ برگته

Me-nanti ara ta' ber-getah.

To wait for a fig which is devoid of milk (latex).

To wait endlessly.

105 مننتي فلير کمبيڠ ترفوتس

Me-nanti pelir kambing ter-putus.

To wait the severing of the goat's penis.

To wait for something which although it appears to be imminent, never really comes to pass.

106 مولت مأنيس مماتهکن تولڠ

Mulut manis mem-atah-kan tulang.

Gentle words (*lit.*, a sweet mouth) break bones.

Men are deceived by flattery.

Compare Proverb 72 in this collection.

107 نامي تأ دايڠين فيڠگن تأ رتق

Nasi ta' dingin pinggan ta' retak.

If the rice be not cold the plate will not be cracked.

This expression is best explained by the following line which is often added to it:—

اديق فون تأ ايڠين ابڠ فون تأ هندق

Adek pun ta' ingin abang pun ta' handak.

A BIBLIOGRAPHY OF MALAYA,*

FROM JULY, 1890, TO JUNE, 1891,

BY

C. DAVIES SHERBORN, F.G.S., F.Z.S.

In compiling this Bibliography, all sources of information have been utilized. In inserting, therefore, every publication that has come under his notice, the compiler hopes that the entries will prove of considerable assistance; but, as a large proportion of the literature of this district, either never reaches England at all, or else arrives so long after as to be too late for examination for this purpose, he begs the reader's indulgence for any error that may be present. His thanks are due to M. Martinus Nijhoff of The Hague for information as to some of the more recent books.

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* By "Malaya" is here meant that part of the Archipelago enclosed in a line drawn round the North of Siam and the Philippines, through Macassar Strait between Lombok and Bali, round the outlying Islands of Java and Sumatra and to the East of Nicobar and Andaman Islands.

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OCCASIONAL NOTES.

THE PUTRI OF MOUNT OPHIR.

The Dato' of Johol states. Putri GANDARÍA lives on Mount Ophir, but she often visits other territories, such as the watershed of the Gemencheh River.

She is seen by mankind under the following circumstances. Boatmen going down the stream will see a very ugly old woman on the bank. She has with her a cat, and slung over her shoulder is a small bag containing saffron.

The old woman shouts to the boatmen to stop and take her with them down stream. The boatmen seeing that she is old and ugly take no notice of her. In a moment the boat grounds on a sand-bank and the boatmen cannot get off again.

The old woman then cries " Let me get into the boat and all will be well." The boatmen agree, and the old woman gets into the boat. No sooner has she got in than the boat glides off down stream. They travel together for some time when the old woman says she wishes to land. The boatmen draw up to the bank and she lands, at the same time giving them each a piece of the saffron from her bag, which the instant it touches their hands turns into gold. At the same time the ugly old woman and her cat disappear.

This is how Putri GANDARÍA is seen by men, and to meet her does not forbode misfortune, but on the contrary is the signal of rare good luck.

She can transform her cat into a tiger, and people are afraid to hunt her out and molest her. The tradition is that if she is sought for or disturbed, she will certainly order her cat to assume the shape of a tiger, who will avenge her by devouring such obtrusive persons. Putri GANDARÍA does not live on the very summit of Gunong Lédang. I never heard of any one living there.

In Monsieur LEÓN JAUSSEN'S translation of GODINHO DE EREDIA'S "Account of Malacca," the Putri of Gunong Lédang is mentioned:—

" * * * * Gunoledam, where lived the Enchantress 'Putry Raynha' a female Magician who in like manner to the Sorceress ERICHTHO the Thessalonian transformed, by virtue of certain plants, women into tigers, into birds or into other kinds of animals." And again:—

"According to a fable common amongst the Malays, the Queen Putri, wife of PERMICURI, the founder of Malacca, retired to the mountain and she lives there still having become immortal by means of magic art. Her dwelling place is on the summit of the mountain in a cavern, where she reclines on a couch formed of the bones of the dead and she shows herself in the shape of a beautiful young girl dressed in silk * * * * * * *."

The Dato' of Johol's version is probably the aboriginal version representing the Putri as an ugly old woman with a cat. GODINHO DE EREDIA'S version is the civilized Malay version treating the lady as young and beautiful and dressed in silk in accordance probably with the ideas in similar Arabic stories.

M. L.

DIAMONDS IN THE MALAY PENINSULA.

GARCIA DA ORTA in his *Aromatum Historia,* Lib. I, p. 171, treating of diamonds says:—"Alia est rupes ad fretum Tanjam in Malacæ tractu, quæ etiam de Rupe veteri cognominatos profert. Exigui quidem sunt sed laudati: unum tamen habent vitium quod ponderosi sint, quo nomine gratiores sunt venditoribus quam emptoribus."

"There is another rock at the Strait of Tanjam in the territory of Malacca, which produces [diamonds] of the class called old-rock diamond. They are few but valuable: however they have one fault, that they are heavy, wherefore they are more valued by the sellers than the buyers."

We have not any record of late of the discovery of diamonds in the Peninsula, but where is the Strait of Tanjam? Is it a perversion of Tanjong, and if so which Cape is it?

H. N. R.

DESCRIPTION OF A NEW SPECIES OF JUNGLE FOWL, SAID TO COME FROM BORNEO.

The specimen from which this description is taken was in confinement in the Botanic Gardens, Singapore, and was obtained in 1890 from a Malay dealer who had two of them (both males) for sale, and who said they came from Borneo. I have named this species *Gallus violaceus* on account of the conspicuous violet gloss of the hackles and tail feathers, which is the most distinguishing feature of the bird. This beautiful jungle fowl resembles *Gallus varius* of Java in having only a single throat wattle and in the hackles being round ended instead of lance shaped as in the other members of the genus. It however differs from *G. varius* in having a serrated comb, and in its colouring.

Description of Adult Male.

Comb large and serrated. Throat wattle single. A yellowish patch edged with purplish blue at each side of throat wattle. Neck hackles rounded at the ends, not lance shaped, and of a beautiful metallic violaceous purple, each feather very narrowly edged with black. Lower feathers of the neck shot with metallic green. Wings.—Primaries black slightly glossed with invisible green. Secondaries black, broadly edged with dull chestnut on the outer webs. Greater wing coverts black, glossed with invisible green, the uppermost row broadly edged on both webs with deep red brown, those of the secondaries slightly edged outwardly with chestnut. Median coverts and scapularies bright chestnut shaded with black. Lesser coverts dark green edged with black and some of the feathers glossed with metallic purple. Feathers of the back and rump bright golden chestnut broadly shaded with metallic purple and black. Tail black glossed with metallic purple, metallic green at base. Under tail-coverts olive black glossed with metallic green and purple. Feathers of the throat black streaked with chestnut. Abdomen blackish slightly glossed with purple. Feathers of and vent black tipped with chestnut. Under side of wings dark brown with a silvery sheen. Irides yellow ochre. Bill light brown, darker at base. Legs pinkish white. Claws whitish.

In the specimen described, there are one or two irregular white blotches on the quills of the wings.

Total length (living bird) about 28 inches. Wing 9 inches. Bill from gape 1.0 inch. Tarsus 3.5 inches.

H. J. KELSALL.

A LARGE MIAS IN SINGAPORE.

There was in Singapore in November last one of the largest, if not the largest, Mias that has ever been captured. It was a male and probably of the species known as *Simia satyrus,* Linn., or the Mias Pappan of the Dyaks. He was captured in Borneo, and bought by a native dealer in Singapore, who eventually sold him to a German ship's captain, by whom he has been, it is believed, taken to Germany.

As far as I could judge, his height must have been close on 4 feet 5 inches. The cage in which he was confined was 4 feet 2 inches or thereabouts in height, and he could easily touch the top of it with his head without standing erect. His face was immensely broad, the cheeks being flattened out sideways into a sort of disc. The hair was long (about 4 inches) and thick and of a bright red colour and he had a distinct short pointed beard. The eyes dark brown.

WALLACE in the *Malay Archipelago,* chap. 4, discusses the size of the Mias at some length, and concludes by saying "on the whole, therefore, I think it will be allowed that up to this time we have not the least reliable evidence of the existence of Orangs in Borneo more than 4 feet 2 inches high." This specimen, however, was distinctly bigger than this.

The method said to have been adopted by the natives in catching this huge animal was ingenious. They pounded up a quantity of chillies into a paste, of which they made pellets. These pellets they blew by means of their *sumpitans* into the eyes of the unfortunate Mias, or Orang Utan, who rubbed its eyes to try and ease the pain, and thus made them worse and soon became quite blinded for the time being, and was of course in frightful agony. The natives then proceeded to cut down the tree in which the wretched beast was, and when it was on the ground, not knowing which way to turn from its tormentors, they seized it by the neck by means of two long poles fastened together like a gigantic pair of scissors, and thus placed it in the cage prepared for it, which was then firmly closed.

H. J. K.

NOTE ON THE NEST AND EGGS OF *NYCTIORNIS AMICTA.*

On the 22nd August, 1891, when walking along a jungle track close to the limestone cave at Kota Glanggi (near Pulau Tawar, Pahang) a Malay who was just a short distance in front of me collecting plants for Mr. RIDLEY, called my attention to a hole in the ground, which he said was a "*Sarang Burong,*" or bird's nest, and he said he was sure there were eggs in it, as he had seen a green bird about the size of a ground dove (*Chalcophaps indica*) come out of it. The hole was close to the path and in the side of a slight mound. The mouth was just large enough for me to get my hand into, and oval in shape. I could not reach the end of the tunnel, so I made the Malay cut away the ground, following the tunnel, and when he had got about 30 inches from the mouth he took out two white almost globular eggs. There appeared to be no nest proper, the eggs being simply laid at the end of the tunnel, which was nowhere more than 6 or 8 inches below ground and as nearly as possible horizontal. Mr. DAVISON, to whom I gave the eggs as soon as I got to camp, identified them as those of a bee-eater and undoubtedly of *Nyctiornis amicta.*

The dimensions of the eggs are as follows:—

1.25 × 1.15 inches.
1.22 × 1.10 inches.

The eggs are now in the Singapore Museum.

H. J. K.

NEST AND EGGS OF *HENICURUS RUFICAPILLUS,* TEMM.

On the 23rd July, 1891, while out collecting in the neighbourhood of our camp at Kuala Tahan (Pahang Ulu) and looking out for birds up a small streamlet flowing through the thick jungle, I found a nest of *Henicurus ruficapillus* with three eggs in it. The hen bird was sitting on the nest, and flew off on my approach. I did not get a shot at her. The nest, which is shallow, cup-shaped, and 6 or 7 inches in diameter, is made entirely of moss and lined with the skeletons of leaves. It was built on to the side of an almost perpendicular rock, very much after the fashion of that of the water ouzel. Nest and eggs are now in the Singapore Museum.

The eggs are white spotted and blotched with light red and pale purplish red, the spots being larger and concentrated into a ring round the larger end. One egg was broken while blowing, the dimensions of the other two are as follows:—

0.97 × 0.66 inches.
0.90 × 0.68 inches.

H. J. K.

ON THE OCCURRENCE OF *PETROSAVIA* IN PERAK.

During a short trip to Perak in February last, I collected a quantity of a small yellow saprophytic plant growing sporadically among the vegetation along the banks of the road from the tea-gardens to Maxwell's Hill, and also on the Hermitage Hill. On examining it at leisure, I found it to agree very well with the description of a rare plant known as *Petrosavia stellàta,* Becc., described and figured in the *Nuove Giornale Botanico Italiano,* iii 7, t. 1. BECCARI collected his specimens in Borneo, on Mount Poe, near Sarawak, at 3,000 feet altitude, and, as far as I am aware, it has not been collected there since, and it has not hitherto been recorded from the Malay Peninsula. It, therefore, forms another addition to the Bornean types to be met with in the Malay Peninsula.

Petrosavia is a slender, wiry, yellow herb with an underground rhizome, over three inches long, covered with small papery scale leaves. The stems rise from the end of the rhizome, one or more together, from three to seven inches tall, often slightly zigzag, and thickest at the base, where they are covered with numerous crowded sheathing leaves, lanceolate acuminate in shape, about $\frac{1}{4}$ inch long. The stems are slenderer above, and the leaves fewer and smaller. The flowers are arranged in a corymbose raceme, they are small, one-eighth of an inch across, yellow, and on rather long ($\frac{3}{4}$ inch) pedicels. The bracts resemble the upper leaves, and are about $\frac{1}{8}$ inch long. There are two to each flower. The sepals are lanceate acuminate, short and small. The petals much larger, ovate, blunt, alternating with the sepals. The stamens are six in number, three opposite the sepals, and three opposite the petals. Their filaments are shorter than the petals, thickened at the base and tapering upwards. The anthers are oblong, rounded, dorsifixed, the cells divergent at the base, and splitting along the edge. The pistils are three, connate at the base, widely spreading above. The ovaries are conical follicular, tapering to the small round stigmas. The carpels are three in number, and split on the inner and upper face nearly as far as the stigmas; they each contain about twelve elliptic, oblong, brown, nodulose seeds, which are full of oil and proteids, but contain no starch. Mr. PERCY GROOM, during his residence in Singapore, has examined them carefully under the microscope, and has discovered the embryo, which had escaped all other observers. It is very minute, and resembles that of the parasitic *Monotropa*, or Indian pipe, of the English woods.

The plant is probably saprophytic, taking its nourishment from the decaying leaves in which it grows, but it is possible that it is parasitic on some other plant or tree. It frequents the drier parts of the wood, at from 2,000 to 3,000 feet elevation.

Petrosavia seems certainly to belong to the order *Liliaceæ,* an order but scantily represented in the Malayan region, but its affinity to any other liliaceous plant is very obscure. The whole order is most plentifully represented in the North temperate region, and in Africa and Australia, but species occur in almost every part of the globe. In the Malay Peninsula we have very few genera—*Dracæna,* with a number of species; *Smilax,* four or five; *Dianella,* one species; and a very curious plant, the *Tupistra (?) singaporiana, Bak,* found in Singapore many years ago by Dr. WALLICH, and never seen since, unless a remarkable plant, of which one specimen in fruit was found by myself and Mr. CURTIS in the *Cypripedium* valley on Penang Hill this spring, is this species. All these have berried fruit, but *Petrosavia* belongs to the capsule-bearing section of the order.

Mr. BAKER, in the Journal of the Linnean Society, vol. XVII, p. 492, and HOOKER in the *Genera Plantarum,* put it in the neighbourhood of *Tofieldia,* which in the latter work is classed with the section *Nartheciæ,* but it seems to me to be more nearly allied to the *Anthericeæ*. It is, however, very distinct from any genus in either of these groups, and, owing to its peculiar habit (for it is the only known saprophytic liliacea), it is so modified that many of its characters throw no light on its relationship. Besides its saprophytic habit, it is almost unique in having the carpels of the capsule free from each other and spreading widely, and in the peculiar structure of the seeds. Our further researches into the Malayan flora may, we may hope, eventuate in discovering other liliaceous plants allied to *Petrosavia* which will enable us to clear up doubts as to its position.

H. N. R.

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